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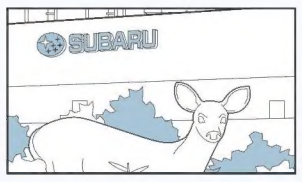

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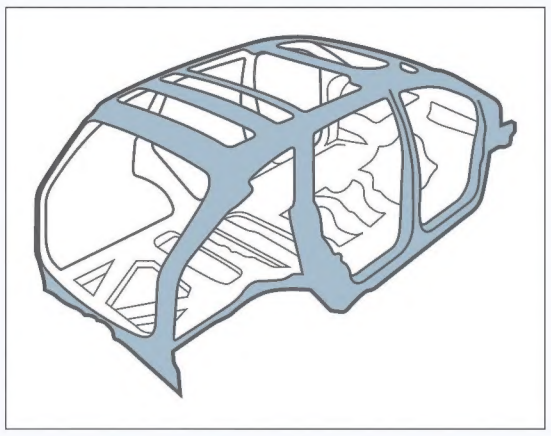

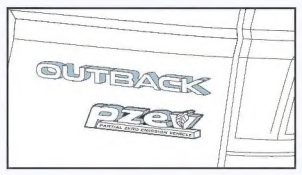

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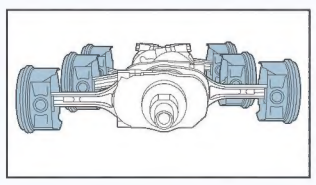

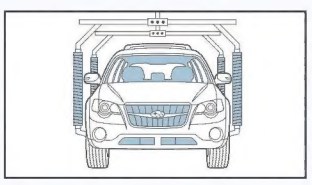

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Where others see old, soulless computers, photographer Mark Richardson finds beauty, as his unlikely still lifes testify

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BY DAVID DEVOSS

For those who can decipher its arcane script, ice has fascinating stories to tell.

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THIS PAGE: Due to the immensity of its ice cap, the Tibetan Plateau, which is guarded by some of the world's highest mountains, is often referred to as the Third Pole. Photograph by Craig Lovell / Corbis.

COVER: In 1991, the crumbling but culturally and architecturally rich Casbah (an ancient alleyway) was named a Unesco World Heritage site. Photograph by Eric Sander.

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THIS PAGE: Edward Hopper, *Sea Watchers*, 1952. Artwork: Heirs of Josephine N. Hopper / Licensed by Artists Rights Society (ARS), New York; photograph: courtesy of the Whitney Museum of American Art, New York.

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Painting did not come easily to Edward Hopper. Each canvas represented a long, morose gestation spent in solitary thought.

"HOPPER," PAGE 56

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*Based on model year 2005 CAFE average fuel-economy ratings and weighted sales for passenger-car and light-truck fleets sold in the U.S. by major manufacturers. †Civic Hybrid and Fit Sport with 5MT shown. 2007 EPA mileage estimates: 49 city/51 highway, 33 city/38 highway, respectively. Use for comparison purposes only. Actual mileage may vary. ©2006 American Honda Motor Co., Inc. environmentology.honda.com

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A slideshow of Edward Hopper's works
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Ancient Rome's Forgotten Paradise
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What astronomers are finding
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Jewel of the Jungle
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The sun sets at Angkor, Cambodia

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FROM THE EDITOR

History Lessons

Revising the past to better understand it

BY CAREY WINFREY

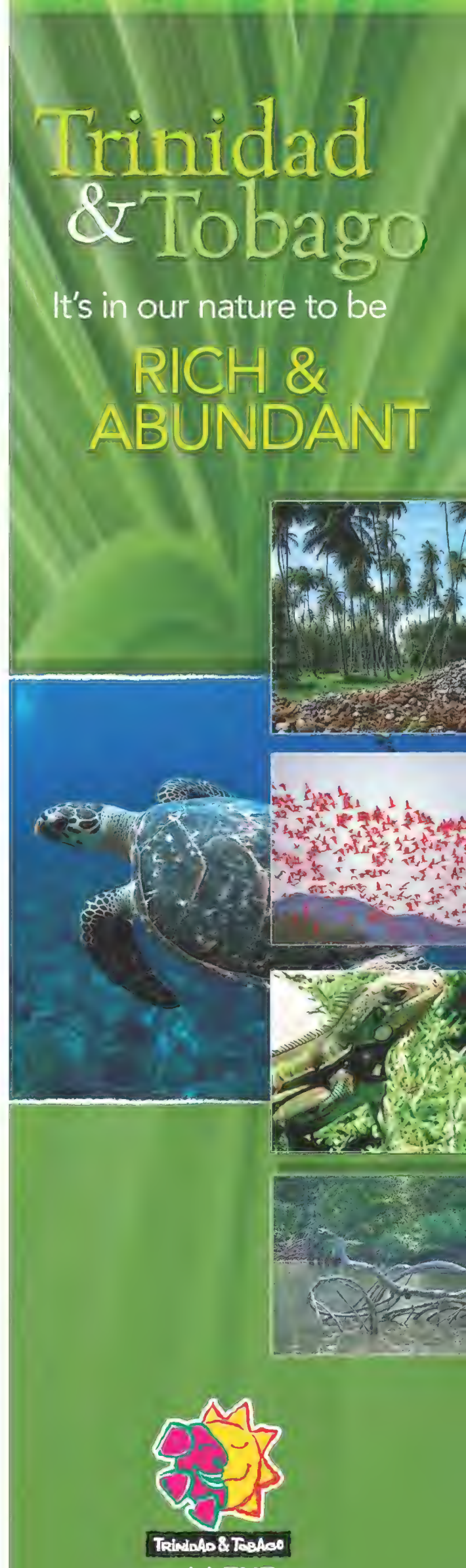
"I THINK MOST AMERICANS don't realize how close we came to losing the Revolutionary War," says the historian John Ferling, who wrote "100 Days that Shook the World," p. 44. "Most people think that after the Battle of Trenton at the end of 1776, everything was turned around and victory was assured, and that's just not the case," he says. "Washington himself said that 1781 was the low point of the war. There was about a year there, before the Battle of Yorktown, when everything was just hanging in the balance."

In his article, Ferling, a professor emeritus at the University of West Georgia and the author of *A Leap in the Dark* (2003), about the American Revolution, concentrates on a little more than three months of that fateful year and the eye-opening exploits of American general Nathanael Greene—"a person," Ferling notes, "of great daring and courage." Without Greene's successful Southern campaign, culminating in the defeat of the British at Yorktown, the colonists might well have lost the war. "I think what would have happened," Ferling says, "is that the major powers in Europe, who wanted the war to end because it was interfering with their trade, would have called a peace conference and said, 'OK, here are the terms—take it or leave it.' We would have come out with a United States of nine or ten states completely surrounded by Britain. We would have been hemmed in, we wouldn't have had much trade; the chances of the United States surviving would have been negligible. Probably a lot of powerful people would have said, 'Forget independence. Let's just go back with England.' The war came close to ending that way."

DeVoss: Filling in gaps from wrecks.

ANN RUSHTON

THE ORIGINS of the story by David DeVoss, "Bringing up the Past," p. 80, date to 1972 when he was a *Time* correspondent in Vietnam and first learned about Chinese ceramics from art historian Roxanna Brown. As thousands of displaced South Vietnamese streamed south following an invasion by the North Vietnamese, Brown was heading north, trying to make her way to the old shipping records at the Imperial City in Hue, before they were destroyed or looted. A decade later DeVoss ran into Brown again in Thailand, where she was certifying the authenticity of the ceramic treasures that marine archaeologists were just beginning to bring up from the South China Sea. "These wrecks were being found at a pretty good rate," DeVoss says, "and they were filling in gaps in Asian history. One day it hit me that this is not only an adventure story about treasure at the bottom of the sea but it is also a quest for the lost history of Southeast Asia, which is being brought up to the surface after 400 or 500 years in the water."



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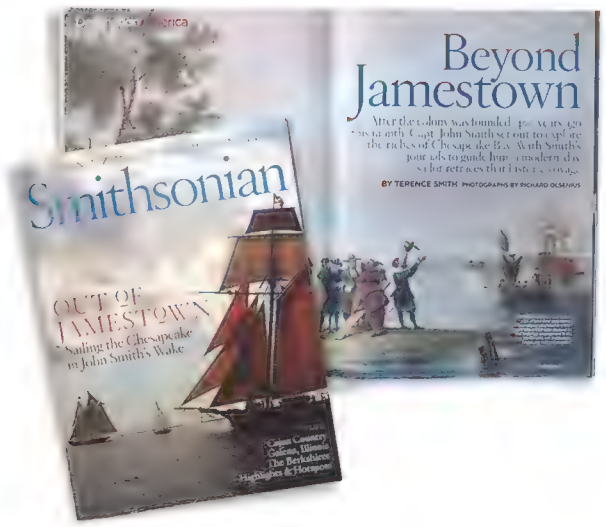

I live on Chesapeake Bay ("Beyond Jamestown"), and I'm distressed by what I'm seeing. The natural habitat of the shoreline is being destroyed for housing developments and estates with manicured lawns that stretch out to the water's edge for the sake of a growing population that is uninformed, greedy or selfish. When do we wake up?

ILONA DUNCAN
HEATHSVILLE, VIRGINIA

FATE OF THE BAY

WITH A MODERN road atlas and magnifying glass at my side, I read with great pleasure Terence Smith's replication of Capt. John Smith's exploration of Chesapeake Bay. Some years ago the Chesapeake enamored me too, when I explored its shores on a chartered sailboat. Smith's article helped me imagine a clean bay rich in "protein," a sight I doubt anyone will ever see again. I grieve such losses.

BEVERLY MCCONNICO
PENSACOLA, FLORIDA

DISCOVERING GILGAMESH

I FOUND "Epic Hero," about archaeologist George Smith and his discovery of the epic saga of Gilgamesh, most compelling. Like other epic heroes, such as Odysseus, Smith traveled to far-off lands on a quest; he demonstrated superior intelligence; he appeared brave when confronted with opposing forces; and his accomplishments established him as a significant figure among his peers. But unlike other more traditional epic heroes, Smith was cruelly deprived the final stage of his heroic quest—a return to his place of origin. Imagine Odysseus being denied by the gods his return to Ithaca. Imagine Penelope waiting for a husband who never comes home. What a tragic ending.

SHARON BRAUSE
SEDALIA, MISSOURI

OBSTINATE EDISON

I DON'T LIKE the current fad of asking, "What would so and so do?" or, in this instance, "What would Edison do?" ("Let There Be Light"). The question betrays an insufficient appreciation for Edison's legendary stubbornness. Edison only liked the stuff he invented, and defended his ideas against all comers. He invented the incandescent lamp, not the fluorescent lamp. In addition, Edison was convinced that only direct current electricity should be used, and the fluorescent lamp uses alternating current. I disagree with the author's assertion that today Edison "would be working under the light of CFLs," or compact fluorescent lamps: though fluorescent lamps are a good idea, Edison would have fought them tooth and nail.

DONALD F. PEPPER
CARLSBAD, CALIFORNIA

LINNAEUS WAS A BIGOT

I LEARNED MUCH about Carl Linnaeus in Kennedy Warne's glowing tribute to the father of taxonomy ("Organization Man"), but he did not mention that Linnaeus was the first scientist to introduce the concept of race, subdividing human beings into four categories according to what he perceived to be their physical and psychological traits. In 1758, he wrote, among other things, *Americanus* was "obstinate," *Asiaticus* "avaricious," *Africanus* "indolent" and *Europeaeus* "inventive." However brilliant he may have been, his misguided classification of humanity initiated a scientific justification for inhumanity that persists to this day. Praise should be tempered.

ANNA KINSMAN
WASHINGTON, D.C.

LINNAEUS was not above whimsy. The Narragansett Indians harvested the quahog, a large clam found in Rhode Island's Narragansett Bay, to mint wampum, beads made from the shells and used as money. Linnaeus dubbed the bivalve *Mercenaria mercenaria,* meaning pay or wages.

GEORGE VETTER
PROVIDENCE, RHODE ISLAND

CORRECTIONS:

"This Month in History" incorrectly stated that the *Hindenberg* was fueled by hydrogen. Diesel powered the airship and hydrogen provided lift.

Alas, lawn seats for Tanglewood concerts ("The Berkshires") are not free, as reported. They cost $9 to $19.

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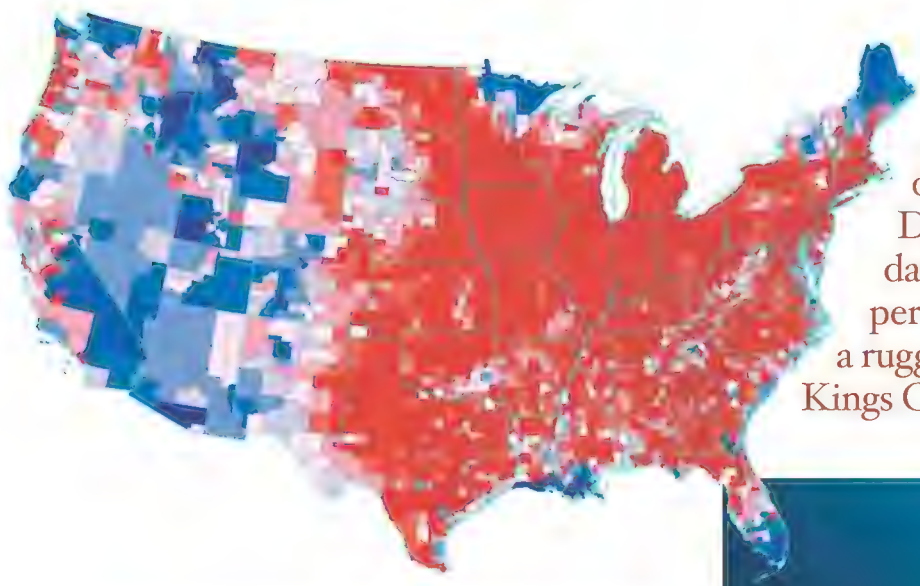
WILD THINGS

LIFE AS WE KNOW IT

BY AMY CRAWFORD, T.A. FRAIL, LAURA HELMUTH AND DAVID ZAX

MYSTERY TREES GET ID

People have long known the location of earth's oldest forest, thanks to an 1869 flash flood that exposed 385-million-year-old fossilized stumps in the eastern New York town of Gilboa. But what the trees looked like was a mystery—until now. Two beautifully intact specimens, discovered a few miles from the site of the ancient forest, show that the stumps came from *Wattieza* trees, according to researchers from Binghamton University and elsewhere. The trees (one is drawn at right) looked like modern tree ferns and grew 25 feet tall or more.



POUNDED BY PAVEMENT

To assess wilderness and open spaces in the lower 48, the U.S. Geological Survey has created this map. It shows the average distance to the nearest road in each county. Dark red indicates the densest road networks, dark blue the sparsest. The least roaded space per resident? Hinsdale County, Colorado, a rugged stretch of the Rockies. The most? Kings County, New York, a.k.a. Brooklyn.

DOWN FOR THE COUNT

A loggerhead turtle has set a new world record for breath-holding by a marine vertebrate. The winning time of more than 10 hours shattered the previous record of 7.5 hours, also held by a loggerhead. Lingering in cold water may help the turtles, which are considered threatened, lower their metabolism during winter months. "There is still so much we don't know about them," says Annette Broderick of England's University of Exeter, who helped record the feat while tracking turtle migrations in the Mediterranean Sea.

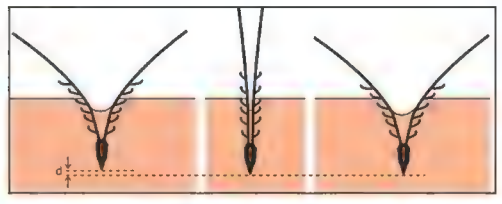
Observed

NAME: *Uca terpsichores*, a species of fiddler crab.

WHAT HE THINKS: "Look at my big claw! Look at the dome of sand I have built over my bachelor burrow! Let's mate!" (Meanwhile, a crab-eating grackle flies overhead.)

WHAT SHE THINKS: "Whew, a sand dome!" (She hides next to it till the grackle passes.)

WHAT SCIENTISTS THINK: The female's attraction to the male's "sand hood" is something new. Other sexual signals, such as a peacock's flashy feathers, are thought to advertise a male's superior genes. But the female fiddler crab, according to a study at the Smithsonian Tropical Research Institute in Panama, has a more practical and immediate motivation: she may be attracted to the male's sand hood for the camouflage it offers from predators.



DIGGING IN

Wild wheat seeds can actually dig into the ground, according to a new study from the Max Planck Institute in Golm, Germany. Each seed has a pair of long appendages, called "awns," that are normally bent apart (see diagram). When the humidity rises, as often happens at night, the awns take up water and straighten; they relax as the air dries. Tiny barbs anchor the seed in the soil and help the awns force the seed downward, putting it in a better position to sprout. It seems to be a rare case of a seed planting itself.

Visit Smithsonian.com to see a wheat seed crawl.

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Behind the Veil

Photographer Alen MacWeeney wanted to see Ireland's Travellers as they were **BY DAVID ZAX**

Cherry Orchard, 1965: "She was playful with the camera," the photographer says.

ALEN MACWEENEY

IN THE SUMMER OF 1965, an Irish photographer named Alen MacWeeney came to a field on the outskirts of Dublin that was strewn with scrap metal and stippled with sheds and the small covered wagons the Irish call caravans. Cherry Orchard, as the field was named, was an improvised campsite of Travellers, Ireland's traditionally nomadic ethnic minority. Something like gypsies—though unrelated to them—the Travellers were more commonly called "Tinkers" back then, since many did a bit of metalwork to mitigate their often dire poverty.

MacWeeney entered Cherry Orchard somewhat fearfully; he shared the deep mistrust of Travellers common to middle-class Dubliners at the time. He was hoping to get a picture of a Traveller woman for a photo essay on William Butler Yeats' poems, one of which describes a girl dancing "a tinker shuffle / Picked up on a street." He intended to get the necessary shot as quickly as possible and move on. Instead, he kept coming back for half a decade.

Though Travellers are known as a closed and clannish bunch, MacWeeney had no trouble making friends in Cherry Orchard and the other camps he went on to visit. The Travellers found it endlessly amusing to listen to the recordings he made of their singing, since most had never heard themselves before. They appreciated the rapt attention he paid to the folk tales they told him, and they treasured the portraits he gave them, sometimes fashioning foil frames for them out of chocolate wrappers. "He'd sit down with us all, light the fire, like one of our own. . . . He had time for you like," says Kitty Flynn, a Traveller woman MacWeeney befriended.

"I felt a need to show the world (or at least Dublin) what it had dismissed

"I felt a need to show the world what it had dismissed."

and overlooked," MacWeeney writes in his just published book, *Irish Travellers: Tinkers No More.* The book includes several dozen photographs taken between 1965 and 1971: of weddings and funerals, of work and play, of grown men horsing around and of children who seem far older than they are. ("It must have the longest history of *almost* getting published," he says, sounding both exasperated and relieved.) The squalor visible throughout is merely incidental; like the best portraits, MacWeeney's capture the dignity of each subject. Some of the photographs had previously been published and admired, particularly those of Traveller children; the image MacWeeney chose for the cover of his book is of a young girl playfully holding a scrap of cellophane over her face, opposite.

Without meaning to, MacWeeney became one of the foremost amateur anthropologists of Traveller culture. He recorded Kitty Flynn singing "Lovely Willie" because he thought her voice was beautiful and the song deep and soulful. He recorded her father as he told tale after tale because he thought the old man was funny and could spin a good yarn. But when MacWeeney finally took leave of his Traveller friends (to look for a publisher and "to pick up my neglected career," he says), he donated his recordings of their music and folklore to University College Dublin; it was the largest collection of Traveller-related material the institution had ever received.

Though there are more Irish Travellers today than ever (there were some 7,000 in the early 1960s; they now number about 25,000), the way of life that MacWeeney documented has all but vanished. Beginning in the '60s, the Irish government began to curb Travellers' freedom to travel. The sight of them on the roadside was an eyesore to many settled Irish, says MacWeeney, so Travellers were increasingly corralled into campsites and encouraged to live less peripatetic lives. Now, many younger Travellers choose to become "buffers"—settled people—and move into cities, where many feel ashamed of their distinctive accent. "Things is dying away," says Kitty, now 66, most of whose 14 children have married into settled life. "At that time things was better," she says of the era captured by MacWeeney.

Before they became renowned among aficionados of Irish music, the Fureys—settled Travellers Ted (fiddle) and his sons Paul (spoons), Eddie (guitar) and Finbar (uilleann pipes)—played for MacWeeney (below) at their home in Balleyfermot, Ireland, in 1966.

Ten years ago, the photographer returned to Traveller camps to make a documentary film about his old friends. "Some had died, some had gone away; others picked up with me as though I'd only gone down to the corner for a pint of milk," he writes. But most of them had settled into houses or campsites.

Wherever he went, MacWeeney showed the photograph of the girl with the cellophane, asking who she was, what had become of her and how he might locate her. Someone said she might have been called Mary Ward. "We found everybody, with the exception of that girl," he says. Whether she remained in a Traveller camp or settled in the city, whether she sang Traveller songs to her children and passed on the tales she had been told, and whether she will recognize herself peering through cellophane on the cover of MacWeeney's book is anybody's guess.

DAVID ZAX *is an intern at* SMITHSONIAN.

ALEN MACWEENEY; HAZEL HAMMOND

To hear some of Alen MacWeeney's recordings of Irish Travellers, go to Smithsonian.com.

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MY KIND OF TOWN

SAN FRANCISCO, CALIFORNIA

The "Howl" heard round the world: The publication, in 1956, of beat poet Allen Ginsberg's generational anthem by City Lights (above), and a subsequent obscenity trial over it, brought the bookstore enduring fame. Author Armistead Maupin (below) revels in San Francisco's reputation for tolerance.

"Mad, Stark Mad"

Thirty-five years after "defecting" to the Barbary Coast, the bestselling novelist still loves his city by the bay **BY ARMISTEAD MAUPIN**

A **RECENT EPISODE** of "South Park," the animated show on Comedy Central, was devoted to the notion that hybrid-driving liberals in San Francisco had caused a toxic "cloud of smug" to form over the city, threatening the entire nation. That's closer to the truth than I'd like to admit.

We San Franciscans *can* be a little smug sometimes, a little too patriotic about our beloved city-state. But, frankly, it's hard not to feel that way when you've lived here for any time at all. This place is special—a patchwork of villages huddled on seven hills above the bluest of bays. We've got wild parrots in our trees and mom-and-pop stores on the corner and world-class olive oil down at the Ferry Building. These days we've got an elegant new museum in the park and a tree-lined boulevard where an ugly freeway offramp used to be. We've got that strapping young mayor too—who became even more irresistible to the ladies when he married some gay folks down at City Hall. Hell, we've even got the woman who is leading the House of Representatives now—the first woman to do so—and though she's cleverly disguised as a Catholic grandmother at a country club, she's our kind of gal.

MARK PETERSON / REDUX; MARK RICHARDS

And we've been right about things. Sorry, but it has to be said: we've been right about things for a very long time. Wacky, godless, treasonous San Francisco, standing alone in its madness, spoke out about global warming and the war in Iraq and George W. Bush long

Rebels with causes: In 1868, former slave Mary Ellen Pleasant sued two S.F. trolley car lines (a c. 1875 cable car, top), securing the right of African-Americans to ride the city's streetcars. The city's Pride Parade (above) has celebrated gay diversity since 1969.

before the rest of America finally woke up to the truth. So those dreaded "San Francisco values"—tolerance, compassion and peace—aren't sounding quite so flaky in a country disillusioned by Abu Ghraib and Hurricane Katrina.

Don't get me wrong. We're no wiser than the rest of America—just a lot freer. We can think our foolish thoughts and chase our foolish schemes without hindrance from church or state or the neighbors down the block. We are free to transgress—politically, artistically, sexually and spiritually—and we believe that a great deal of good has emerged from that. That's why, in the end, we don't really care what the rest of America thinks of us. We've been immune to those taunts since 1849, when the *New York Post* described the citizens of San Francisco as "mad, stark mad."

There was justification, mind you. The crazed fortune hunters who created this place left their ships to rot in the harbor on their way to the gold in the hills. That's how certain they were that they would never return to their homes in the East. Their ships, what's more, were dragged out of the water and into the muddy streets, where they found brash new lives as hotels and jailhouses—weird Dr. Seussian hybrids of vessel and building that stood for years as proof there was No Going Back. The past, having outlived its usefulness, had been carpentered into the future.

A century and a half later—despite earthquakes, epidemics and dot-com disasters—people still chase their dreams to San Francisco. They don't so much move to the city as defect to it, warmed by the glow of their burning bridges. Like the heroine of my *Tales of the City* novels, newcomers have been known to take this leap overnight, enduring high rents, low pay and joblessness in the hope of becoming someone else.

It's not that we don't revere tradition: we do, deeply. But ours is a tradition of eccentricity and earthly pleasures and a healthy disrespect for the powers that be. And most of us, I've found, love reciting the lore of our rebellious history. When visitors arrive from elsewhere, I myself can be every bit as garrulous as a docent in an antebellum mansion in Georgia. Here, for instance, are some of the things I enjoy telling them:

- That Mary Ellen Pleasant, a former slave who settled here after the Civil War, secured the right of black people to ride the trolleys in San Francisco almost a century before Rosa Parks refused to sit in the back of that bus in Alabama.
- That Mark Twain, while steaming in a Turkish bath on the site of the current Transamerica Pyramid, struck up a friendship with a local fireman whose homespun-sounding name—Tom Sawyer—would later prove useful to the storyteller.
- That Billie Holiday was busted for drugs in a room at the Mark Twain Hotel.
- That the ashes of gunfighter Wyatt Earp were buried in a Jewish cemetery south of San Francisco so that his beloved widow could later be interred with him.
- That Jack Kerouac wandered away

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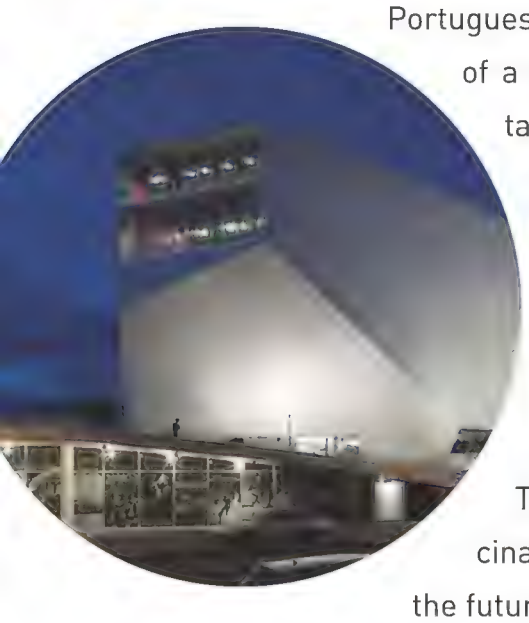

Today's Portugal is a fascinating place where the future and the sumptuous past harmoniously exist side-by-side. The opulent palaces, abbeys, and forts built with the exuberance of the exploration still shine today as they did 500 years ago. The brilliant mix of that legacy is still alive in Portugal's culture, music, and arts. From the Tower of Belém, built at the very spot from which Vasco da Gama sailed to India, to the Great Abbey at Batalha where Prince Henry is buried, the mystery, glory, and achievement of our ancestors await. As do soaring, new public buildings and art centers that complement the innovation and spirit of our Renaissance past.

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POUSADAS DE PORTUGAL

vini portugal

By 1850, hundreds of vessels had been left at anchor in Yerba Buena Cove, abandoned by crews rushing to the gold fields; the *Niantic* (above) was reconstituted as a hotel. Maupin (below, at 28 in 1972) arrived in the city fresh from a tour of duty in Vietnam.

from Neal Cassady's cottage on Russian Hill to stumble upon Joan Crawford, larger than life in pumps and a fur, shooting *Sudden Fear* in the fog.

■ That the Twin Peaks bar at Castro and Market was the first gay bar in America to have windows on the street, making the patrons visible to the general public.

■ That Joe DiMaggio and Marilyn Monroe, like Rosie and Kelli O'Donnell, were married at San Francisco City Hall.

■ That Jeanne Bonnet, a swashbuckling lass who frequented the brothels of the Barbary Coast dressed as a man, later convinced some of the prostitutes to flee their pimps and join her own all-girl band of pickpockets.

■ That the Lusty Lady, a modern-day Barbary Coast establishment on Kearny Street, struck its own blow against the exploitation of women when, in 2003, it became the first worker-owned peep show in the nation.

■ That in 1927 a fresh-faced young Mormon named Philo T. Farnsworth transmitted the world's first television image in a laboratory at the foot of Telegraph Hill.

■ That the brain of Ishi, the last "wild" Native American and a one-time San Francisco celebrity, was returned to California in 2000 after spending almost a century in a Smithsonian Institution warehouse in Maryland.

■ That among the words San Francisco has given the dictionary are beatnik, yuppie, hippie, hoodlum and shanghaied.

I was none of those things when I arrived in San Francisco in 1972 to work for the Associated Press. Fresh out of the South and a tour of duty in Vietnam, I was seriously conservative and frightened to death of almost everything, especially my own homosexuality. (It was, after all, still officially a mental illness, not to mention a crime.) But when I worked up the nerve to confess my "condition" to a new friend—a young married woman with children—she stared at me soulfully, took both my hands in hers and murmured a dewy-eyed "big f------ deal." I could hardly believe my ears. Like the city itself, she was telling me to lighten up and get on with the business of my life.

That proved to be my born-again moment, the watershed from which I date my transformation. In San Francisco I found love the way I'd always wanted it. I found friends of every imaginable variety. I found my creativity and a generous audience and a seemingly endless supply of stories to tell. After too many years of searching, I found, in other words, the age-old American promise of life, liberty and the pursuit of happiness.

So I dragged my ship out of the harbor and made it my home for good.

ARMISTEAD MAUPIN's *novel* Michael Tolliver Lives *was published in June.*

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THIS MONTH IN HISTORY

JULY ANNIVERSARIES

MOMENTOUS OR MERELY MEMORABLE

BY ALISON McLEAN

175 YEARS AGO TO THE SOURCE!

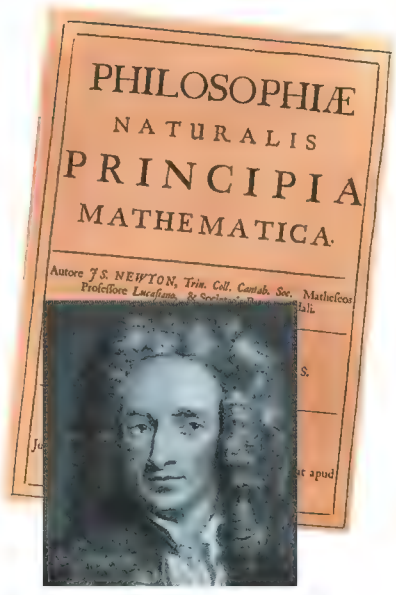
Explorer and ethnologist Henry Schoolcraft leads a search for the headwaters of the Mississippi in July 1832, and finds them in a Minnesota lake he dubs Itasca, a contraction of *veritas* and *caput* (true head). Though history credits Schoolcraft with "discovering" the river's source, he has help: local Ojibwa Indians give him detailed directions. His later writings on Native culture are a source for Longfellow's "Song of Hiawatha." Schoolcraft dies in 1864.

100 YEARS AGO THE AGE OF FOLLY

Florenz Ziegfeld exposes a bevy of bathing beauties to New York theatergoers when his *Follies of 1907* opens July 8. The 13-act revue's sketchy plot involves such characters as Pocahontas, Teddy Roosevelt and Enrico Caruso, but like the Parisian *Folies Bergère* on which it is modeled, it's the showgirls who keep new editions of Ziegfeld's *Follies* running until 1931. Ziegfeld dies in 1932, age 65.

320 YEARS AGO APPLE OF HIS EYE

"Nature does nothing in vain," writes English physicist Isaac Newton in his masterwork *Philosophiae Naturalis Principia Mathematica* (Mathematical Principles of Natural Philosophy), published July 1687. His explanations of nature's behavior, the laws of motion and universal gravitation, are the basis for the subsequent science of mechanics. Newton is knighted in 1705 and dies in 1727, age 84.



50 YEARS AGO TEA FOR TOTS

Animator and amusement park mogul Walt Disney keeps the tea cups—and kids—spinning when he patents the design for the Mad Tea Party ride at Disneyland, July 9, 1957. The cups and saucers—designed by Disney and collaborator Bruce Bushman—are inspired by Disney's animated feature, *Alice in Wonderland* (1951); the mechanics are based on earlier rides. A park draw since 1955, by 2007 the "unbirthday" ride makes more than 115 million tea partyers dizzy.

160 YEARS AGO FIRST AMONG MANY

Clerks hand cut the first United States postage stamps, which go on sale in New York City on July 1, 1847. The 5- and 10-cent stamps, which feature Ben Franklin, the nation's first postmaster general, and George Washington, begin to unify the rapidly expanding country's unruly postage system. More than 130 other Franklin stamps follow, but Washington holds the record, at 305.

130 YEARS AGO TENNIS, ANYONE?

Spencer Gore, 27, bests William Marshall 6-1, 6-2, 6-4 to win the All England Croquet and Lawn Tennis Club's first championship in the new game of lawn tennis in Wimbledon, July 19, 1877. The sport quickly eclipses croquet, (the 1881 contest, right), and a ladies' singles event is added in 1884. By 2003, Wimbledon is international, and today the world's most prestigious tennis tournament draws top players from some 60 countries.

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IMPORTANT SAFETY INFORMATION: LUNESTA works quickly, and should be taken right before bed. Be sure you have at least eight hours to devote to sleep before becoming active. Until you know how you'll react to prescription LUNESTA, you should not drive or operate machinery. Do not use alcohol while taking LUNESTA. Most sleep medicines carry some risk of dependency. Side effects may include unpleasant taste, headache, drowsiness and dizziness. See important patient information on the next page.

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Lunesta™ (eszopiclone)

1, 2 AND 3 MG TABLETS

Please read this summary of information about LUNESTA before you talk to your doctor or start using LUNESTA. It is not meant to take the place of your doctor's instructions. If you have any questions about LUNESTA tablets, be sure to ask your doctor or pharmacist.

LUNESTA is used to treat different types of sleep problems, such as difficulty in falling asleep, difficulty in maintaining sleep during the night, and waking up too early in the morning. Most people with insomnia have more than one of these problems. You should take LUNESTA immediately before going to bed because of the risk of falling.

LUNESTA belongs to a group of medicines known as "hypnotics" or, simply, sleep medicines. There are many different sleep medicines available to help people sleep better. Insomnia is often transient and intermittent. It usually requires treatment for only a short time, usually 7 to 10 days up to 2 weeks. If your insomnia does not improve after 7 to 10 days of treatment, see your doctor, because it may be a sign of an underlying condition. Some people have chronic sleep problems that may require more prolonged use of sleep medicine. However, you should not use these medicines for long periods without talking with your doctor about the risks and benefits of prolonged use.

Side Effects

All medicines have side effects. The most common side effects of sleep medicines are:

- Drowsiness
- Dizziness
- Lightheadedness
- Difficulty with coordination

Sleep medicines can make you sleepy during the day. How drowsy you feel depends upon how your body reacts to the medicine, which sleep medicine you are taking, and how large a dose your doctor has prescribed. Daytime drowsiness is best avoided by taking the lowest dose possible that will still help you sleep at night. Your doctor will work with you to find the dose of LUNESTA that is best for you. Some people taking LUNESTA have reported next-day sleepiness.

To manage these side effects while you are taking this medicine:

- When you first start taking LUNESTA or any other sleep medicine, until you know whether the medicine will still have some effect on you the next day, use extreme care while doing anything that requires complete alertness, such as driving a car, operating machinery, or piloting an aircraft.
- Do not drink alcohol when you are taking LUNESTA or any sleep medicine. Alcohol can increase the side effects of LUNESTA or any other sleep medicine.
- Do not take any other medicines without asking your doctor first. This includes medicines you can buy without a prescription. Some medicines can cause drowsiness and are best avoided while taking LUNESTA.
- Always take the exact dose of LUNESTA prescribed by your doctor. Never change your dose without talking to your doctor first.

Special Concerns

There are some special problems that may occur while taking sleep medicines.

Memory Problems

Sleep medicines may cause a special type of memory loss or "amnesia." When this occurs, a person may not remember what has happened for several hours after taking the medicine. This is usually not a problem since most people fall asleep after taking the medicine. Memory loss can be a problem, however, when sleep medicines are taken while traveling, such as during an airplane flight and the person wakes up before the effect of the medicine is gone. This has been called "traveler's amnesia." Memory problems have been reported rarely by patients taking LUNESTA in clinical studies. In most cases, memory problems can be avoided if you take LUNESTA only when you are able to get a full night of sleep before you need to be active again. Be sure to talk to your doctor if you think you are having memory problems.

Tolerance

When sleep medicines are used every night for more than a few weeks, they may lose their effectiveness in helping you sleep. This is known as "tolerance." Development of tolerance to LUNESTA was not observed in a clinical study of 6 months' duration. Insomnia is often transient and intermittent, and prolonged use of sleep medicines is generally not necessary. Some people, though, have chronic sleep problems that may require more prolonged use of sleep medicine. If your sleep problems continue, consult your doctor, who will determine whether other measures are needed to overcome your sleep problems.

Dependence

Sleep medicines can cause dependence in some people, especially when these medicines are used regularly for longer than a few weeks or at high doses. Dependence is the need to continue taking a medicine because stopping it is unpleasant.

When people develop dependence, stopping the medicine suddenly may cause unpleasant symptoms (see *Withdrawal* below). They may find they have to keep taking the medicine either at the prescribed dose or at increasing doses just to avoid withdrawal symptoms.

All people taking sleep medicines have some risk of becoming dependent on the medicine. However, people who have been dependent on alcohol or other drugs in the past may have a higher chance of becoming addicted to sleep medicines. This possibility must be considered before using these medicines for more than a few weeks. If you have been addicted to alcohol or drugs in the past, it is important to tell your doctor before starting LUNESTA or any sleep medicine.

Withdrawal

Withdrawal symptoms may occur when sleep medicines are stopped suddenly after being used daily for a long time. In some cases, these symptoms can occur even if the medicine has been used for only a week or two. In mild cases, withdrawal symptoms may include unpleasant feelings. In more severe cases, abdominal and muscle cramps, vomiting, sweating, shakiness, and, rarely, seizures may occur. These more severe withdrawal symptoms are very uncommon. Although withdrawal symptoms have not been observed in the relatively limited controlled trials experience with LUNESTA, there is, nevertheless, the risk of such events in association with the use of any sleep medicine.

Another problem that may occur when sleep medicines are stopped is known as "rebound insomnia." This means that a person may have more trouble sleeping the first few nights after the medicine is stopped than before starting the medicine. If you should experience rebound insomnia, do not get discouraged. This problem usually goes away on its own after 1 or 2 nights.

If you have been taking LUNESTA or any other sleep medicine for more than 1 or 2 weeks, do not stop taking it on your own. Always follow your doctor's directions.

Changes In Behavior And Thinking

Some people using sleep medicines have experienced unusual changes in their thinking and/or behavior. These effects are not common. However, they have included:

- More outgoing or aggressive behavior than normal
- Confusion
- Strange behavior
- Agitation
- Hallucinations
- Worsening of depression
- Suicidal thoughts

How often these effects occur depends on several factors, such as a person's general health, the use of other medicines, and which sleep medicine is being used. Clinical experience with LUNESTA suggests that it is rarely associated with these behavior changes.

It is also important to realize it is rarely clear whether these behavior changes are caused by the medicine, are caused by an illness, or have occurred on their own. In fact, sleep problems that do not improve may be due to illnesses that were present before the medicine was used. If you or your family notice any changes in your behavior, or if you have any unusual or disturbing thoughts, call your doctor immediately.

Pregnancy And Breastfeeding

Sleep medicines may cause sedation or other potential effects in the unborn baby when used during the last weeks of pregnancy. Be sure to tell your doctor if you are pregnant, if you are planning to become pregnant, or if you become pregnant while taking LUNESTA.

In addition, a very small amount of LUNESTA may be present in breast milk after use of the medication. The effects of very small amounts of LUNESTA on an infant are not known; therefore, as with all other prescription sleep medicines, it is recommended that you not take LUNESTA if you are breast-feeding a baby.

Safe Use Of Sleep Medicines

To ensure the safe and effective use of LUNESTA or any other sleep medicine, you should observe the following cautions:

1. LUNESTA is a prescription medicine and should be used ONLY as directed by your doctor. Follow your doctor's instructions about how to take, when to take, and how long to take LUNESTA.
2. Never use LUNESTA or any other sleep medicine for longer than directed by your doctor.
3. If you notice any unusual and/or disturbing thoughts or behavior during treatment with LUNESTA or any other sleep medicine, contact your doctor.
4. Tell your doctor about any medicines you may be taking, including medicines you may buy without a prescription and herbal preparations. You should also tell your doctor if you drink alcohol. DO NOT use alcohol while taking LUNESTA or any other sleep medicine.
5. Do not take LUNESTA unless you are able to get 8 or more hours of sleep before you must be active again.
6. Do not increase the prescribed dose of LUNESTA or any other sleep medicine unless instructed by your doctor.
7. When you first start taking LUNESTA or any other sleep medicine, until you know whether the medicine will still have some effect on you the next day, use extreme care while doing anything that requires complete alertness, such as driving a car, operating machinery, or piloting an aircraft.
8. Be aware that you may have more sleeping problems the first night or two after stopping any sleep medicine.
9. Be sure to tell your doctor if you are pregnant, if you are planning to become pregnant, if you become pregnant, or if you are breastfeeding a baby while taking LUNESTA.
10. As with all prescription medicines, never share LUNESTA or any other sleep medicine with anyone else. Always store LUNESTA or any other sleep medicine in the original container and out of reach of children.
11. Be sure to tell your doctor if you suffer from depression.
12. LUNESTA works very quickly. You should only take LUNESTA immediately before going to bed.
13. For LUNESTA to work best, you should not take it with or immediately after a high-fat, heavy meal.
14. Some people, such as older adults (i.e., ages 65 and over) and people with liver disease, should start with the lower dose (1 mg) of LUNESTA. Your doctor may choose to start therapy at 2 mg. In general, adults under age 65 should be treated with 2 or 3 mg.
15. Each tablet is a single dose; do not crush or break the tablet.

Note: This summary provides important information about LUNESTA. If you would like more information, ask your doctor or pharmacist to let you read the Prescribing Information and then discuss it with him or her.

Rx only

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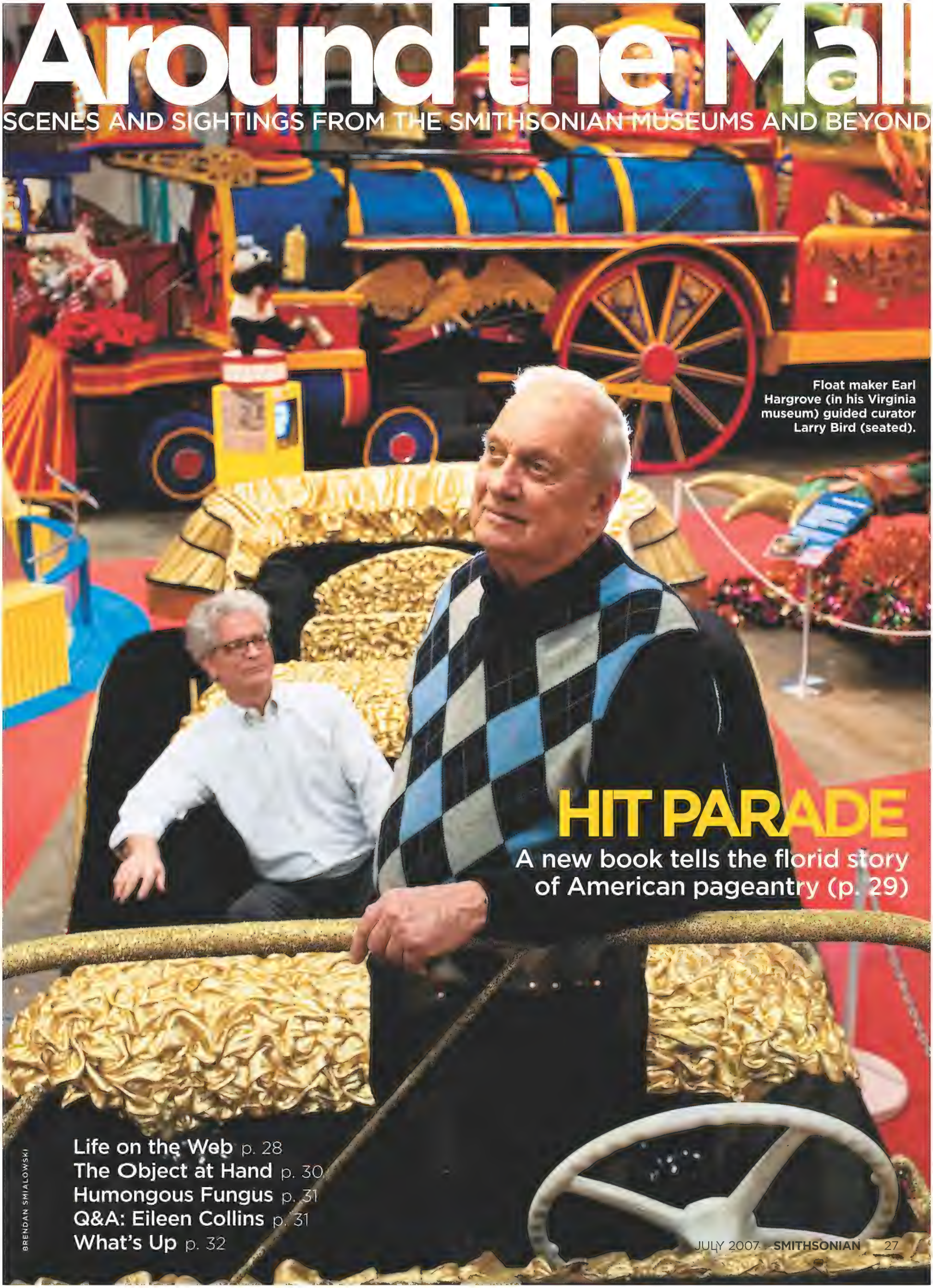
Around the Mall

SCENES AND SIGHTINGS FROM THE SMITHSONIAN MUSEUMS AND BEYOND



Float maker Earl Hargrove (in his Virginia museum) guided curator Larry Bird (seated).

HIT PARADE

A new book tells the florid story of American pageantry (p. 29)

Life on the Web p. 28
The Object at Hand p. 30
Humongous Fungus p. 31
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BRENDAN SMIALOWSKI

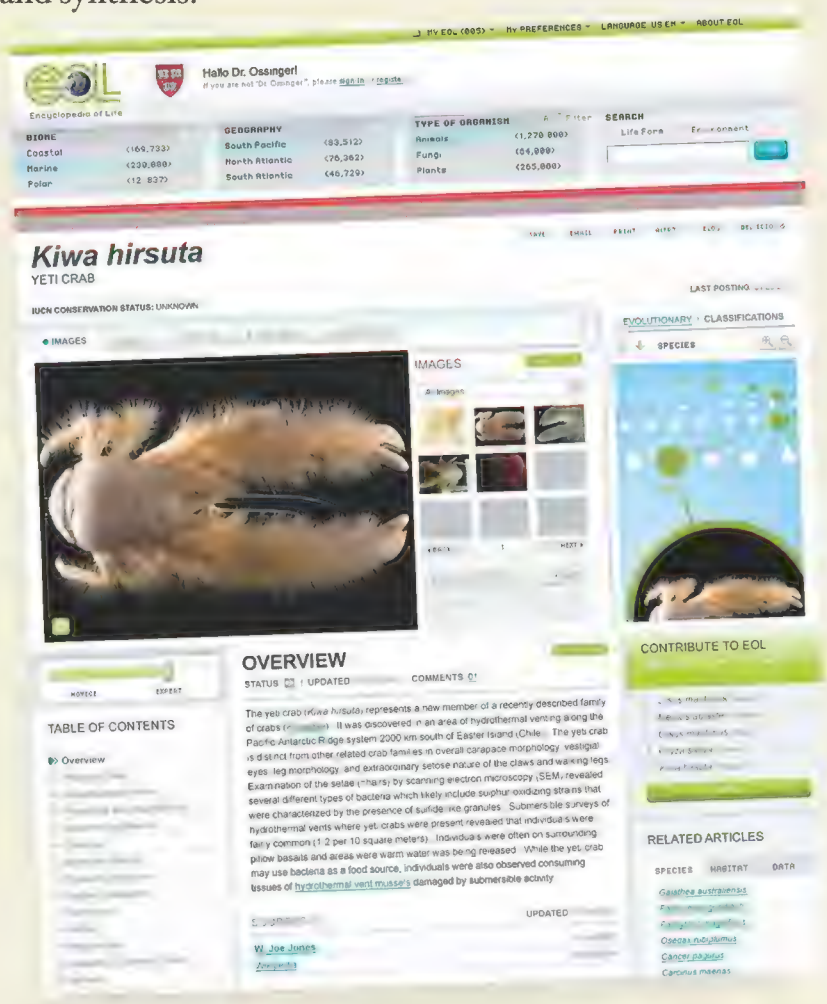
FROM THE CASTLE

Life on the Web

BY CRISTIÁN SAMPER

FOLLOW A BUMBLEBEE in flight, then observe it resting on a sunflower. What is it doing? Why? How does it fit into the natural world? The Smithsonian Institution is a leading partner in an exciting new initiative called the Encyclopedia of Life (EOL), an unprecedented Internet site designed to help answer such questions. Over the next five years, the EOL will generate a million Web pages, help digitize a large portion of scientific literature, generate educational materials for schools and universities, and contribute to new scientific analysis and synthesis.

The idea behind this ambitious project is deceptively simple: construct a Web site accessible through a single Web portal for each of the 1.8 million known living species on earth. Like a good field guide, each entry will present authoritative and scientifically verified information about such things as geographic range, habitat, natural history and conservation status. Each site will also offer interactive illustrations showing, for example, how a species fits into the evolutionary tree as well as detailed maps and pictures—even, in many cases, sound and video clips. Each site's opening pages will be designed for the general public, but they will also provide links to specialized, scientific literature for molecular biologists, geneticists, teachers, horticulturists, conservationists and other specialists.



A deceptively simple idea: a Web site for each known species.

In a world of shrinking resources, this information will help people make wiser decisions about preserving our natural world. The EOL will also give users access to the Smithsonian's unsurpassed collections, strengthen the Institution's collaborations with other organizations and give new global reach to our core mission—the increase and diffusion of knowledge.

The idea is compelling, but it is not new. Smithsonian scientist Terry Erwin and others have long advocated the creation of a comprehensive Web catalog of the natural world. And in a 2003 article, "Encyclopedia of Life," the well-known entomologist E. O. Wilson (once my graduate school adviser, now a colleague and friend) envisioned "an electronic page for each species of organism on Earth . . . a summary of everything known."

Two forward-looking institutions, the Alfred P. Sloan Foundation and the John D. and Catherine T. MacArthur Foundation, have generously given $12.5 million for the first two years of the five-year EOL project and pledged a like amount when it meets expectations.

The EOL's headquarters, or secretariat, will be based at the Smithsonian's National Museum of Natural History (NMNH). But the EOL is a global enterprise, involving scores of institutions and thousands of scientists. All of its partners will participate in its success. NMNH and Harvard's Museum of Comparative Zoology will lead efforts to maximize the EOL's educational uses. A group organized through the Marine Biological Laboratory at Woods Hole, Massachusetts, will provide leadership on software development to access information in Web sites all over the world. Another group, coordinated by the Field Museum in Chicago, will head up activities to ensure that the EOL will facilitate scientific discoveries about biodiversity, conservation and evolution of life. And the Biodiversity Heritage Library, a consortium of natural history libraries here and in Great Britain, will scan and digitize the vast amount of information available to the EOL.

This great endeavor is one of many ways the talented professionals throughout the Smithsonian will strengthen the public's trust in our work as we improve our capacity to bring new knowledge and our collections to more than 300 million Americans and billions of people worldwide. So that in the future, when your curiosity takes flight, the EOL and the Smithsonian will offer destinations galore.

CRISTIÁN SAMPER, *Acting Secretary of the Smithsonian Institution, played a lead role in creating the Encyclopedia of Life.*

Visit Smithsonian.com to watch a video about the EOL and to see sample pages.

FRITZ RAUSCHENBACH / ZEFA / CORBIS; ENCYCLOPEDIA OF LIFE

The Float Builder and the Scholar

A top displayman shows a historian how to love a parade

WHEN THE CURATOR Larry Bird began researching the history of parades, there was one man he just had to meet: Earl Hargrove, among the nation's premier float makers. Hargrove has fashioned floats for every presidential inaugural since Harry Truman's and for hundreds of other parades along the Eastern Seaboard since the 1940s. "He basically taught me the business," says Bird, whose book *Holidays on Display* (Smithsonian Institution/Princeton Architectural Press) is due out this fall.

Hargrove, 79, started out in the 1930s dressing store windows with his father, Earl, Sr., in the Washington, D.C. area. Earl Hargrove is an American archetype—a "quintessential displayman," Bird says, part artisan, entrepreneur and showman. By the 1950s, Hargrove's eponymous company was working parades from Atlantic City (15 Miss America Pageants) to Louisiana.

Hargrove's vast workshop in Lanham, Maryland, is appropriately

Many of Earl Hargrove's early parade floats were kitschy advertising vehicles: left, a 1948 service station promo he did with his father, Earl, Sr.; top left, a leggy c. 1952 hosiery pitch; Miss Virginia shoulders a restaurant rocketship (undated).

outlandish: there are pink flowers as big as La-Z-Boys, a two-story King Kong and what looks to be the feet of Goliath. Some 100 boxes hold fake flowers from Kennedy's inauguration. "Everything I look at, I see something that can be put together as a float," he says. He continues to buy—and repackage—props from the Tournament of Roses Parade and other festivities. Float making, says Bird, of the National Museum of American History, has provided Hargrove "with a creative outlet for self-expression that's often overlooked historically. Even when it is acknowledged in the culture—think of the Macy's Thanksgiving Day Parade and the Tournament of Roses Parade—it is often underestimated as an art form." Today, though Hargrove creates floats for presidential inaugurals and Philadelphia's Thanksgiving Day Parade, his company now specializes in displays for trade shows.

As old-fashioned parades seem to be fading in popularity, Hargrove is enshrining favorite floats at his museum, American Celebration on Parade, near the Virginia tourist attraction Shenandoah Caverns, which he owns, in the town of the same name. At the museum, sparkling polar bears, eagles and dragons are mounted atop truck and bus chassis. An 85-foot Wyoming float—Vice President Dick Cheney's in the last inaugural—features a stuffed bison next to a trickling waterfall. Another, from Bill Clinton's first inaugural parade, hosts a Dixieland band of pelicans, including one on saxophone.

Bird wonders who will ornament the capital city's floats and ceremonies in the future. Hargrove, he says, "is the last guy standing." { BY KATY JUNE-FRIESEN }

SHENANDOAH CAVERNS (3)

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THE OBJECT AT HAND

Aviator Coat

NATIONAL AIR AND SPACE MUSEUM

THE FLIGHT STUFF

Amelia Earhart brought her own special style—even to her outerwear

BY OWEN EDWARDS

A FEW STEPS AWAY from a sleek 1928 Lockheed 5B Vega aircraft, a glass display case at the National Air and Space Museum contains a brown leather coat that once belonged to Amelia Earhart, the legendary aviator who disappeared in the South Pacific 70 years ago this month. The jacket, lined in gray tweed, is fastened by four oversize buttons. She wore it on flights in the Vega, the plane in which she became the first woman to fly solo across the Atlantic in 1932 (five years after Charles Lindbergh made history with his flight). "It's an elegant coat," says Air and Space curator Dorothy Cochrane, "very much in keeping with fashions of the '20s and '30s."

Earhart (in 1937) was equally at home in the air and on the pages of fashion magazines.

Almost immediately upon taking her first flight, in 1920, Earhart decided to become a pilot. Within two years, she had set a new altitude record (14,000 feet) for women. And when Amy Guest, a wealthy American aviation enthusiast, wanted to sponsor the first transatlantic flight by a woman in 1928, the 31-year-old, photogenic Earhart was the obvious choice. Though her role was merely as a passenger—two men actually piloted the plane from Newfoundland to Wales—George Putnam, a publicist who had helped select her, made sure Earhart got the lion's share of press attention. (She would marry Putnam in 1931.)

Four years later, on May 20, 1932, Earhart took off from Newfoundland, alone in the Vega, and landed 15 hours later in Northern Ireland. From then on, she shared the celebrity stratosphere with movie stars and wealthy socialites, in demand for appearances and product endorsements. She even became the aviation editor of (the original, more literary) *Cosmopolitan* magazine.

Earhart had always been interested in clothes. Her first flight instructor, Neta Snook, recalled her showing up for lessons in "a beautifully tailored [riding] outfit." Indeed, says Cochrane, the Smithsonian's flight jacket seems to evoke

Visit Smithsonian.com to view a video clip of one of Earhart's final takeoffs.

MARK AVINO / NASM, SI; BETTMANN / CORBIS

equestrian fashions from the '30s. (In time, Earhart would help to design and publicize a line of clothes marketed for "the woman who lives actively.")

The pretty, daring young flier became a friend of the new first lady, Eleanor Roosevelt; the president himself eased Earhart's preparations for a much-ballyhooed flight around the world, scheduled for 1937. Aware of America's need for heroes in the midst of a global depression, FDR ordered the Navy to prepare landing strips and a refueling station on a tiny mid-Pacific speck called Howland Island.

Earhart and navigator Fred Noonan, flying west to east, headed first to Miami, then to South America, Africa, Asia and eventually to Lae, in New Guinea. The two took off the morning of July 2, 1937, fully fueled, for the 2,556-mile over-water flight to Howland.

The pair were plagued by radio-frequency problems, preventing communication with ships in the area. After some 17 hours, an anxious and exhausted-sounding Earhart reported that she and Noonan were low on fuel about 100 miles from Howland. At 20 hours, she again radioed her position. At which point, the lady vanishes.

An intensive Navy search for signs of the Lockheed Electra and its pilot and navigator came up empty and was eventually abandoned. To this day, a dedicated group of unofficial searchers continues to comb tiny islands on both sides of the Equator.

When a person who is both famous and celebrated disappears without a trace, as Amelia Earhart did, their most everyday possessions can take on an immense power. So it is that something as ordinary as Earhart's flying coat, donated in 1961 by the late Lewis Miller of Tarpon Springs, Florida, takes on a commanding poignancy. The jacket—mounted on a dressmaker's form—retains the shape of the person who wore it; it may be as close to Amelia Earhart as we are likely to get.

OWEN EDWARDS *is a freelance writer and author of the book* Elegant Solutions.

CHRIS LIVINGSTON / ZUMA / CORBIS; MARY PARRISH / NATIONAL MUSEUM OF NATURAL HISTORY, SI

Q&A

The first woman to pilot and command the space shuttle, retired U.S. Air Force colonel **EILEEN COLLINS**, 50, recently gave a public talk at the Air and Space Museum. She spoke with the magazine's Amy Crawford.

WHAT SPARKED YOUR INTEREST IN FLIGHT? Since about fourth grade I had been interested in the space program, and from there I learned about the Air Force. Probably 90 percent of my reading was about male pilots, but that was OK. I just could never get enough books.

DID YOU ALWAYS THINK YOU COULD BE A PILOT? Oh yes. The woman issue was never a big one for me as a child. I had heard, "This is for men." But why fight it, just go do it!

WHY IS THE SPACE PROGRAM IMPORTANT? I believe that the long-term survival of the human species depends on getting us off this planet. We've got to start taking small steps now because it is such an expensive and difficult endeavor that it takes generations. We need more space stations in lower Earth orbit, we need research stations on the Moon and we need to send people to Mars.

WHY SHOULD WE SEND PEOPLE INSTEAD OF ROBOTS? You need to send both. Unmanned rovers need to go first, if we're going to make it safe for people to go. Then people will go, and people can add that versatile dimension of being able to look around.

WHAT WAS THE COOLEST PART OF BEING IN SPACE? The floating is great, microgravity is great, looking back at the Earth is great.

DO YOU THINK SPACE TOURISM IS A GOOD IDEA? There's huge potential—I'm surprised it's taken so long. People will get a better understanding of our planet, how fragile it really is and how much we need to take care of it. The downside is people will be risking their lives going up there.

WOULD YOU BE A SPACE TOURIST? I would love to go up again. I really miss my job.

When Mushrooms Ruled the Earth?

A new idea about one of the most puzzling life-forms ever

It towered over the landscape 400 million years ago. One of the weirdest things that ever existed, it reigned as the tallest land-based organism (reaching at least 28 feet) for some 70 million years. But what was it? Ever since the discovery of Prototaxites fossils more than a century ago, scientists have debated the question, with some saying it was an algae and others a primitive conifer. (Its Latin name means "like a yew ancestor.") Now a study says it was more like a giant mushroom. University of Chicago paleontologist C. Kevin Boyce, Smithsonian paleontologist Carol Hotton and others found that different carbon isotopes, or atomic forms, in fossil specimens in the Smithsonian's collections suggest Prototaxites was a fungus. The find thrills Francis Hueber, 78, a National Museum of Natural History emeritus paleontologist. He'd collected Prototaxites fossils on four continents and advocated the fungus theory: "It's so wonderful to finally have it recognized—before it was posthumous!" { BY DAVID ZAX }

What's Up

FRIENDS AND NEIGHBORS

Poet and photographer Ellis Marsalis III, of the famous jazz family, spent a decade chronicling life in his working-class Baltimore neighborhood. Selections from his 2004 book, *thaBloc*, are on view at the Anacostia Community Museum through August 12.

SOME ROCK Set in a 1960s brooch, this 128.54-carat gem (actual size) is one of the world's largest yellow diamonds. On loan to the Natural History Museum until September 23, Tiffany & Co.'s signature stone has only been worn twice—once by Audrey Hepburn to promote, yes, *Breakfast at Tiffany's*.

INTELLIGENT DESIGN

Given the chance to rummage through the Cooper-Hewitt's collections, a team from international design firm IDEO (co-creator of the modern computer mouse) selected more than 30 innovative objects, including this 1944 child's chair by modernists Charles and Ray Eames. On view until January 20.

O MUNDO INTEIRO

"The whole world?" Almost. In the 16th century, Portugal built a trade network that stretched from Brazil to Japan. At the Sackler Gallery and African Art Museum until September 16, some 250 maps, paintings (India governor Afonso de Albuquerque) and artifacts revisit this commercial empire.

ACROSS THE POND

Artist George Frederic Watts' marriage to actress Ellen Terry, 30 years his junior, lasted less than a year, but it resulted in this c. 1864 oil. It's one of 60 paintings and photographs of "Great Britons" that the U.K.'s National Portrait Gallery lends its U.S. counterpart until September 3.

{ BY AMY CRAWFORD }

ELLIS MARSALIS III / ANACOSTIA COMMUNITY MUSEUM, SI; TIFFANY & COMPANY; COOPER-HEWITT NATIONAL DESIGN MUSEUM, SI; LUIS PAVÃO / MUSEU NACIONAL DE ARTE ANTIGA, LISBON; NATIONAL PORTRAIT GALLERY, LONDON

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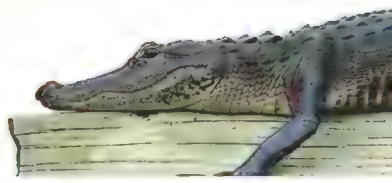


SAVE THE CASBAH

Smithsonian
{ JULY 2007 · VOLUME 38, NUMBER 4 }

In Algiers, preservationists race to rescue the storied quarter. But is it too late?

BY JOSHUA HAMMER
PHOTOGRAPHS BY ERIC SANDER

"YOU WANT TO SEE what is happening to the Casbah?" the slender man asks in French, as I make my way down a steep stone staircase that leads to the Mediterranean Sea. Before venturing into this storied hillside quarter of Algiers, a labyrinth of shadowy alleys and cul-de-sacs filled with idle youths casting suspicious gazes upon outsiders, I'd been warned to keep my guard up, but this fellow's earnest manner persuades me he can be trusted. Introducing himself as Oualid Mohammed, he leads me down the Rue Mustapha Latreche, named after an Algerian guerrilla who fell fighting the French in the Casbah during the war of independence that lasted from 1954 to 1962 and concluded when France ended colonial rule. Then he stops before a crumbling two-story house. "That's where I live," he says. The entire front section is a ruin; the second floor has collapsed onto the first, and the hallway is filled with rubble.

On May 21, 2003, Mohammed tells me, an earthquake measuring 6.8 on the Richter scale struck about 40 miles east of Algiers, killing hundreds of people in this part of North Africa and badly damaging the Casbah. A few weeks later, a government team designated the family's house, which had developed dangerous cracks in the walls and ceilings, a priority for renovation. Then, Mohammed says, in their rush to begin, workmen removed several wooden beams, and the house caved in. Today a dozen family members live jammed into the two remaining rear rooms, waiting for a promised reconstruction to begin. "Nobody from the government has talked to us in two years," he tells me.

Mohammed leads me past the debris-strewn remnants of the house's front, through the kitchen to a dim room in the back. An elderly woman in a *hijab*, his mother, sits on a tattered couch, eating from a plate of olives and bread. A

In the Casbah's narrow passageways, a rare concentration of Ottoman-era mud-brick and stucco houses (left) are collapsing from neglect. "The question," says local preservationist Djamila Issiakhem, "is whether we can ever get [the Casbah] back."

young man is scrunched up on a windowsill, asleep. Mohammed's father, a slight 71-year-old, shuffles into the room. He is Oualid Meziane, who turns out to be a Casbah hero. As a teenage resistance fighter, Meziane says, he carried five-gallon jugs of bomb-making chemicals from safe house to safe house, sometimes under the noses of French paratroopers, and distributed copies of the banned, pro-independence newspaper, *El-Moudjahid*. "We all lived in fear for our lives," he says. "There would be a knock on somebody's door at midnight, and a friend would be taken off—and guillotined." These days Meziane gets by on a $70 monthly pension and a small disability payment for the gunshot wound he got in the crossfire of a battle between Islamic fundamentalist guerrillas and the Algerian Army in 1995. "The real fighters in the war of independence didn't get their due," Meziane says, glancing at his disintegrating abode. "Look at how we're living now."

Spilling down precipitous hills overlooking the Mediterranean Sea, this mazelike quarter of Algiers, the capital of Algeria, has long conjured up both Arab exoticism and political turbulence. Dating back to Phoenician times but rebuilt by the Ottomans in the late 1700s, the Casbah has served over the centuries as a refuge for pirates, freedom

Writer **JOSHUA HAMMER** *recently moved to Berlin.*
Photographer **ERIC SANDER** *is based in Paris.*

The fabled quarter (left) rises above the city of Algiers, its harbor a prize sought by successive invaders. Today, developers eye the Casbah, overlooking serene Mediterranean vistas, as a site to be razed for luxury condominiums.

Himoud Brahimi, the poet laureate of the quarter, in 1966, four years after the Algerian resistance defeated the French occupiers. "Cradle of my birth, where I came to know loyalty and love. How can I forget the battles in your alleys, that still bear the burdens of war?" Djamila Issiakhem, who grew up here in the 1960s as the niece of a famous Algerian artist, remembers the vibrant Casbah of her youth as a place where women and girls, escaping their traditional confinement, congregated in *hammams*, public baths, to gossip and discuss marital prospects. (The suggestive entreaty, "Come with me to the Casbah," is not from the 1938 movie *Algiers*, starring Charles Boyer, but from an impersonation of Boyer by the cartoon character Pepé Le Pew, in *The Cat's Bah*, an animated short.)

But the Casbah's glory days ended decades ago, and much of the old city has crumbled into ruin. During the war for independence, thousands of rural Algerians flocked to the Casbah, where life was marginally safer and rents were cheap. The population climbed from 30,000 in 1958 to more than 80,000 today; as many as ten families crammed into some dwellings, putting unbearable strains on many houses. Earthquakes, torrential rains and flooding eroded foundations and walls further, and when one house fell, it often took down two or three others with it. Today much of the Casbah is a dingy slum, its refuse-strewn lots and fissure-ridden houses reeking of sewage and uncollected garbage. Of 1,200 traditional Ottoman-era buildings, just 680 are considered in good condition. Within a generation, some preservationists say, it is possible that the entire quarter could be uninhabitable. "The Casbah has lost its soul," says Issiakhem, who leads tours of it for Western diplomats and a handful of foreign tourists. "The question is whether we can ever get it back."

It may be too late. Valuable time was lost during the past two decades, when the country was engulfed in a brutal civil fighters, Islamic militants and petty thieves, all of whom found easy anonymity in its alleys and houses sequestered behind imposing stone walls.

But the often violent history of the Casbah has obscured an appreciation of the quarter's architectural and cultural riches. Preservationists consider it one of the most beautiful examples of late Ottoman style. Its once-whitewashed structures, facing onto narrow passages and constructed around enclosed courtyards, contain a wealth of hidden treasures—marble floors, fountains, carved lintels, intricate mosaics. For generations, writers and artists have celebrated the mystery, tragedy and rhythms of life in the Casbah in literature and painting. "Oh my Casbah," wrote

MAP: MIKE REAGAN

The Casbah's once-whitewashed structures contain a wealth of hidden treasures—marble floors, fountains, carved lintels, mosaics.

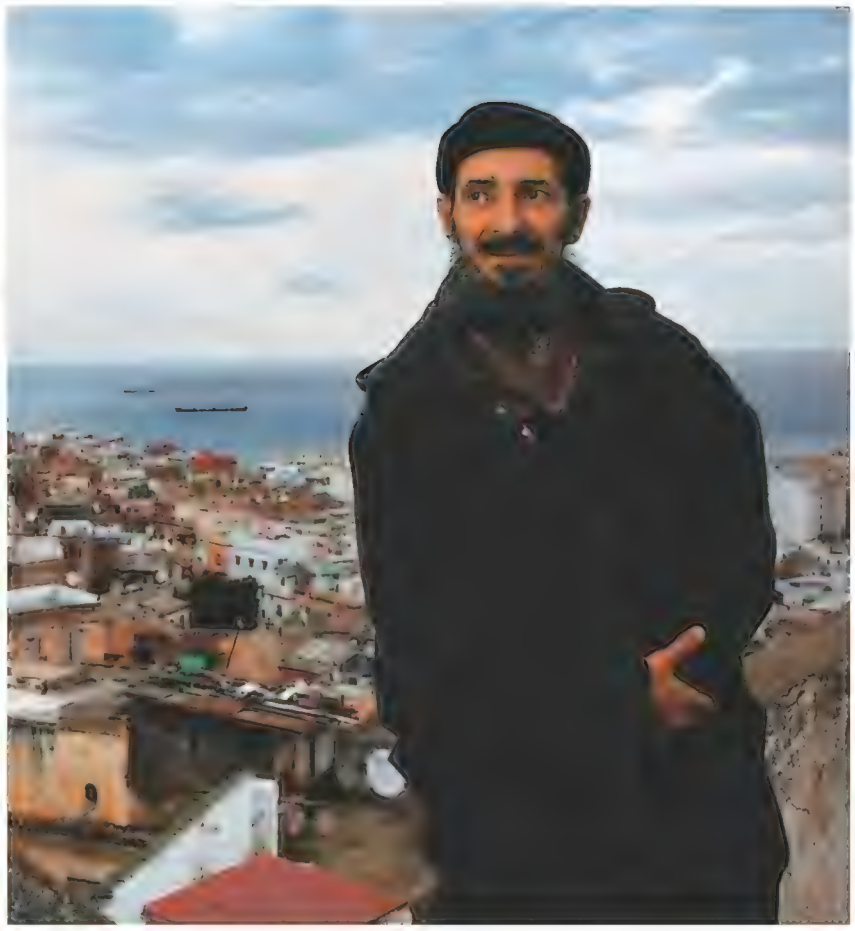
war, known here as the *periode noire*, or "black time." The war broke out in January 1991, after the country's military regime canceled elections that almost certainly would have brought an Islamist party to power. For nine years, Islamic terrorists and Algerian security forces battled in cities and the countryside, and perhaps 150,000 people, most of them civilians, died in terrorist bombings, reprisals and other attacks. "The Casbah was a no-go territory," I was told by Belkacem Babaci, a historian and radio-show host who was born in the quarter in 1941. "Even for somebody like me, who lived there most of his life, it was unsafe." The war wound down in 2000, under President Abdelaziz Bouteflika, a former liberation fighter who continued to send the army to pursue Islamic guerrillas while offering amnesty to those who gave up their weapons. (Perhaps 1,000 armed Islamic radicals, some of whom recently declared allegiance to Osama bin Laden, still carry out attacks against police posts and isolated farms from sanctuaries in Algeria's deserts and mountains. Recently, Al Qaeda claimed responsibility for an April 11 bombing in central Algiers.) When Babaci returned to the old quarter in 1998, after nearly a decade, he was shocked to see how it had degraded.

The coming of peace to Algeria hasn't made the government any more enthusiastic about preserving the old city. Unlike the ancient quarter of Bukhara in Uzbekistan, for example, which has benefited from state support, the Casbah has seen almost no public funding. It isn't for lack of resources: the Algerian government earns $4 billion a month in oil and natural gas revenues, and is believed to have $80 billion in cash reserves. Tourism, in a country still focused on maintaining stability, does not rank high as a government priority—Algiers has only a handful of decent hotels, and the country's hundreds of miles of beaches remain virtually undeveloped. Then there is the Casbah's long-standing reputation as a breeding ground for rebellion. "For the government, the Casbah is a treacherous place," says Abdelkader Ammour, secretary-general of the Casbah Foundation, a preservation group that got the Casbah named a Unesco World Heritage site in 1991. Since then, the foundation has painstakingly mapped the area, house by house, assessing the condition of each structure and outlining restoration strategies. But it has struggled for more than a decade to raise funds and awareness.

BEFORE ARRIVING IN ALGIERS, I had been warned that even venturing into the old quarter would not be smart. Colleagues who had covered the civil war in the 1990s described the place then as a haunt for Islamic militants with a violently anti-Western agenda. Even U.S. diplomats who want to visit the Casbah must first get permission from the government, which provides them with armed security guards. But my local contacts assured me the reports of danger were exaggerated, so, with my guide and driver, Mohammed Ali Chitour, an unemployed civil servant, I head there on a bright morning without escorts. As a gentle salt breeze wafts from the harbor, Chitour leads the way down an ancient stone staircase, hemmed in by teetering mud- and concrete-brick buildings with stucco facades long since disintegrated.

We enter a gloomy world of shadows and dust, of braying donkeys and veiled women, of shafts of sunlight filtering through narrow corridors, and the smells of the sea, fresh baguettes and rotting fruit. The staircase turns into an alley, or *ruelle*, about 12 feet wide. We walk past elaborately carved Ottoman portals that shine through the gloom; one has a black iron door knocker in the shape of a fist, another is flanked by a pair of spiraling, slender columns. The cantilevered overhangs of several houses, supported by pole-like wooden beams, extend so far into the passage they almost touch. We pass beneath an archway formed by a second-floor chamber that vaults between two houses. (An aperture in the vault, dating to the Ottoman era but still of use today, allows the Casbah's female denizens to see out, without being spotted themselves.) Tiny passages, known as *impasses*, spill off the longer alley, ending abruptly in a wall of crumbled brick or masonry. On the lintel of one three-story house, I spy an old Star of David engraved in the stone, evidence of a Jewish presence once upon a time. Just beyond the house, Abdullah Shanfa, a near-toothless man of 54, welcomes Ali and me to his home. We enter a spartan central courtyard, ringed by a three-story loggia, or wraparound arched gallery—a classic Ottoman-era structure built about 300 years ago. The sun has given way to a drizzle; rain trickles through the open skylight onto a slightly sloped floor and drains into gullies.

Shanfa climbs onto his rooftop terrace and clambers to the adjoining roof—six feet higher than his own. "Come on," he says, extending a hand. Trying not to notice the 40-foot drop to the refuse-strewn alley, I grab the edge of the rooftop and hoist my body over the side. I stand up and take in the scene. Like a beehive, the Casbah clings to the hills around me, its dense sea of houses broken by domed mosques and minarets; I can hear the hubbub of crowds in an unseen *souk*, an Arab market, and



Residents throughout the Casbah (clockwise, from top left, Oualid Meziane; Nourredine Bourahala; local guide Mohammed Ali Chitour; historian Djamila Issiakhem) recognize that they live in the midst of irreplaceable architectural riches. Yet they also acknowledge that the hillside, declared a World Heritage site in 1991, faces a race against deterioration from many causes, including overcrowding, earthquake damage and rainstorms. Issiakhem fears that the Casbah has "lost its soul."

the shouts of children playing soccer in an alley below. Beyond the quarter, a sweep of undistinguished, French-colonial buildings rises along the seafront. The Mediterranean, steely gray in the drizzle, laps at the shore. "Better enjoy the view while you can," he tells me. "Bit by bit the Casbah is being destroyed."

A minute later we're joined on the roof by a gaunt, bearded man, Nourredine Bourahala, 56. Like almost everyone else of a certain age in the Casbah, he claims to have been a member of the anti-French resistance. "The French troops picked me up when I was 7 and beat me with batons," he tells us. "I didn't speak the language then, so I don't know why they beat me, but I became a freedom fighter then and there." He leads us back into the alley, past Corinthian columns standing alone like sentries, rubble-strewn lots, houses with facades peeled away, and shells of dwellings that

look more Baghdad than Algiers. As we walk, he shows us an old black-and-white snapshot of three Kalashnikov-carrying young men. "Do you recognize the one in the middle?" he asks. The pugnacious visage, he says, belongs to "Ali LaPointe," the small-time crook turned leader of a cell in the anti-French insurgency, whose short life was immortalized in the 1966 film *The Battle of Algiers*, which unfolds mostly in the Casbah. After a ten-minute walk, we arrive at the house—now rebuilt—where Ali LaPointe and three other young fighters were blown up by French counterinsurgency forces in October 1957, the incident that provided the dramatic opening and finale of the film. The house has been turned into a shrine, attended by an honor guard and adorned with Algerian flags and photocopies of newspaper articles chronicling the bloody struggle. Over the next three days, I'll confront the ghost of Ali LaPointe (real name: Ali Amar) at every turn. Little boys approach me in the alleys, reverently murmuring his name. And everywhere, grizzled veterans like Bourahala—who says he saw Ali LaPointe many times but spoke with him only once—recall their encounters with him as the high point of their lives.

Historian and preservationist Belkacem Babaci (with his son, Hassan, 12, above) believes the ancient quarter can still be saved. "If I weren't an optimist," he says, "I would have closed the door a long time ago and turned my back on the place."

THE CASBAH HAS BEEN DEMOLISHED—and resurrected—many times over two millennia. Around the sixth century B.C., the Phoenicians built a trading port, Ikosim, on the flat ground along the sea. The Romans occupied the same site shortly before the birth of Christ; it was sacked and burned by the Vandals in the fifth century. A Berber Muslim dynasty founded a new city on the ruins, calling it El Djazair, or the islands, named after a latticework of islets just off the coast that form a natural breakwater for the harbor. During the next 500 years, various Berber dynasties surrounded the city with walls and extended it up into the hills.

After Algiers came under Ottoman rule in 1516, they turned the old, walled city into one of the triumphs of North African architecture: city planners built 100 fountains, 50 hammams, 13 large mosques and more than 100 prayer halls. (The word "casbah," from the Arabic for

We enter a gloomy world of shadows and dust,
of braying donkeys and veiled women,
of sunlight filtering through narrow corridors.

With its warren of streets remaining remarkably intact (a view of the same location in the 19th century and today), the Casbah grew up around footpaths snaking up the hillside. As ravines were filled in, ancient gullies became walkways.

LEFT: PRIVATE COLLECTION OF HAMID ISTIENE

fortified place, came to be used not only for the citadel at the summit of the hill, but for the entire city below.) The walled city, under constant threat from European invaders, enforced a curfew, but it was invoked with style: at night a flutist made the rounds, playing a Turkish melody called a *coupe jambe*, to announce it. And the Casbah was awash in wealth: Algerian privateers plied the Mediterranean, plundering European ships and often holding captives for ransom. Fra Filippo Lippi, the master painter of the Italian Renaissance, was taken as a prisoner to the Casbah; so was Miguel de Cervantes, author of *Don Quixote*, following a sea battle in 1575, and ransomed back to Spain after five years—and four escape attempts—for a few hundred gold ducats.

To local historians, including Belkacem Babaci, this Ottoman period represents the apex of the nation's power and glory. Babaci argues that the corsairs had every justification for their actions, considering the declaration of war against the Ottomans by, at various times, Spanish and French rulers. "The Europeans launched 17 expeditions against Algeria in 1541 alone," he told me, as we sipped coffee on the terrace of the El Djazair Hotel, a colonial-era villa

perched high on a hill overlooking the Casbah. "Thirty thousand soldiers were sent to attack the Casbah, in revenge for the 'insolence' of the Algerian corsairs, but they failed."

What the Europeans couldn't destroy, natural disaster did. In 1716, an earthquake flattened three-quarters of the Casbah; the Ottomans rebuilt the city over the next quarter century. By 1871 the French had defeated the Ottomans and indigenous Algerians. They would subject the country to 132 years of French colonial rule. Believing that the Casbah's hivelike alleys offered ideal conditions for armed resistance, the French razed houses within its northern perimeter. They also bisected the city with a central boulevard, the better to move troops, and widened other streets. These thoroughfares, bordered by now-crumbling apartments with French windows and filigreed balconies, provide a dissonant taste of Paris in a deeply Arab milieu. The French face-lift, however, failed to tamp down the spirit of resistance.

MOHAMMED ALI CHITOUR AND I are walking through a neighborhood near the top of the Casbah. Unlike the mottled brown facades and garbage-strewn alleys of the rest of the old city, the buildings here are whitewashed and sparkling, even the cobblestones polished and clean. In 2000, the Casbah Foundation, in cooperation with the then-governor of Algiers, Cherif Rahmani, an ardent preservationist, undertook the most ambitious project yet to save the old city. Reasoning that rehabilitating the quarter would be feasible only if the homes were first emptied, Rahmani spent about $5 million to buy out landlords and relocate 498 families from Sidi Ramdane to apartments in modern Algiers. According to Babaci, who helped to coordinate the program, the idea was to "open the empty houses, let in the sea air and sun, make them breathe again. It would be like operating on the sick, letting them stabilize, letting them convalesce."

In the Casbah (where Ali LaPointe, above, at right, died fighting the French in 1957), Islamist insurgents hid in the 1990s. Preservationist Abdelkader Ammour (at home, opposite, right) believes the quarter is "still regarded with suspicion."

The city got as far as repainting the facades before renovation ground to a halt. Rahmani grew disenchanted and left; his successor turned cold on the project. "I was terribly disappointed," Babaci told me. "At the moment we were just getting off the ground, the whole thing stopped." Today many of the buildings remain padlocked, and "the insides are rotting," I was told by Mohammed Skakre, 78, a local resident, as he sat on a rickety chair in a cobblestone alley in the heart of the whitewashed area. "All the renovation is just talk," he continued. "It's been going on like this for 100 years." The Casbah Foundation isn't the only institution that has been frustrated by the Algerian government: two years ago, a U.S. government-funded development program offered substantial grants for the quarter's rehabilitation if Algeria would make matching contributions. Enthusiastic municipal officials completed the paperwork, but somehow the wali, or governor, of Algiers never finalized the contracts. "This guy stopped a project that could have done a lot of good, and he waited until the eleventh hour to pull the plug on it," says one Western diplomat in Algiers. Last year, impatient Unesco officials threatened to strip the Casbah of its World Heritage status, which would make raising awareness and funding even more difficult. "If I weren't an optimist, I would have closed the door a long time ago and turned my back on the place," Babaci told me. "I still believe it's possible to save it, but you need to empty it, and you need to find qualified people who will respect the style, the materials. It's a huge challenge."

For the moment, a few well-heeled individuals are taking the lead in rescuing the Casbah on a house-by-house basis. On one of the final days of my stay, a guide from the Casbah Foundation led Ali and me down an alley near a busy market. We'd come to meet Moulidj Zubir, whose 400-year-old, once-derelict villa, owned two centuries ago by the British ambassador, serves as a model, we'd been told, of what the old quarter could look like. Zubir, a white-bearded man in his 70s, met us at the entrance. "This was a *maison de maître*," a master's house, he explained, leading us through a marble-tiled entrance hall to a three-story loggia. Sunlight filtered through a crystal skylight, softly illuminating a lavishly renovated palace. Two stories of colonnaded arches, hung with dozens of brass and copper lanterns, encircled the gallery. Each floor was a feast of balustraded balconies; dark teak screens; arches embellished with mosaics of orange, peacock-blue and sea-green flora; thick oak doors inlaid with brass flowers. Salons and bedrooms off the loggia contained silver samovars, Syrian marble-inlaid chairs, Persian carpets, silk curtains. Leading us to the top floor, Zubir gazed down into the atrium. "There are maybe four or five other people who have done what I've done, but no more than that," he said. "I did it for my son, so that he can continue living in the Casbah after I'm gone."

As Ali and I stepped back into the dank alley, a man wearing a dirty T-shirt and shorts emerged from a house across the road and invited us inside. The place looked like a "before" photograph of Zubir's: broken marble floor tiles, fissure-laced walls, rain puddling in the courtyard. Our host smiled apologetically. "We'd love to fix it up," he said. "But that costs money, and we don't have a *sou*." For the handful of preservationists trying desperately to save Algeria's irreplaceable treasure, it was an all-too-familiar lament.

Visit Smithsonian.com for more of Eric Sander's images of the Casbah.

On March 15, 1781, American forces inflicted heavy losses on the British Army at Guilford Courthouse, North Carolina. The redcoats had seemed invincible only a few months before.

100 DAYS THAT SHOOK THE WORLD

The all-but-forgotten story of the unlikely hero who ensured victory in the American Revolution

BY JOHN FERLING

WINTER CLOUDS SCUDDED OVER NEW WINDSOR, NEW YORK, some 50 miles up the Hudson River from Manhattan, where Gen. George Washington was headquartered. With trees barren and snow on the ground that January 1781, it was a "dreary station," as Washington put it. The commander in chief's mood was as bleak as the landscape. Six long years into the War of Independence, his army, he admitted to Lt. Col. John Laurens, a former aide, was "now nearly exhausted." The men had not been paid in months. They were short of clothing and blankets; the need for provisions was so pressing that Washington had dispatched patrols to seize flour throughout New York state "at the point of the Bayonet."

At the same time, many Americans felt that the Revolution was doomed. Waning morale caused Samuel Adams, a Massachusetts delegate to the Continental Congress in Philadelphia, to fear that those who had opposed independence in 1776 would gain control of Congress and sue for peace with Britain. During the past two years, three American armies—nearly 8,000 men—had been lost fighting in the South; Georgia and South Carolina appeared to have been reconquered by Great Britain; mutinies had erupted in the Continental Army and the nation's economy was in shambles. Washington was aware, he wrote to Laurens, that the "people are discontented." Convinced that the army was in danger of collapse, Washington predicted darkly that 1781 would prove America's last chance to win the war. Nothing less than the "great revolution" hung in the balance. It had been "brought . . . to a crisis."

Greene (above) judged his initial prospects for victory as "dismal."

Yet within a matter of months, a decisive October victory at Yorktown in Virginia would transform America's fortunes and save the American Revolution. The victory climaxed a brilliant—now largely forgotten—campaign waged over 100 fateful days by a former foundry manager totally lacking in military experience at the outset of the war. Yet it would be 38-year-old general Nathanael Greene who snatched "a great part of this union from the grasp of Tyranny and oppression," as Virginia founding father Richard Henry Lee would later tell Greene, when the two met in 1783.

IN THE EARLY DAYS OF THE WAR, Britain had focused on conquering New England. By 1778, however, it was clear that this would not be achieved. England's crushing defeat at Saratoga, New York, in October 1777—British general John Burgoyne's attempt to invade from Canada resulted in the loss of 7,600 men—had driven London to a new strategy. The South, as Britain now perceived it, was tied by its cash crops, tobacco and rice, to markets in England. The region, moreover, abounded with Loyalists; that is, Americans who continued to side with the British. Under the so-called Southern Strategy as it emerged in 1778, Britain would seek to reclaim its four former Southern colonies—Virginia, North Carolina, South Carolina and Georgia—by expelling rebel forces there; regiments of Loyalists, also called Tories, would then occupy and pacify the conquered areas. If the plan succeeded, England would gain provinces from the Chesapeake Bay to Florida. Its American empire would remain vast and lucrative, surrounding a much-reduced and fragile United States.

At first, the new strategy met with dramatic success. In December 1778, the British took Savannah, stripping the "first . . . stripe and star from the rebel flag of Congress," as Lt. Col. Archibald Campbell, the British commander who conquered the city, boasted. Charleston fell 17 months later. In August 1780, the redcoats crushed an army led by Maj. Gen. Horatio Gates at Camden, South Carolina. For the Americans, the desperate situation called for extreme measures. Congress removed Gates and asked Washington to name a successor to command the Continental Army in the South; he chose Greene.

NATHANAEL GREENE'S METEORIC RISE could hardly have been predicted. A Quaker whose only formal schooling had been a brief stint with an itinerant tutor, Nathanael was set to work in his teens in the family-owned sawmill and iron forge. In 1770, he took over management of the foundry. In 1774, the last year of peace, Greene, then 32, married Catherine Littlefield, a 19-year-old local beauty, and won a second term to the Rhode Island assembly.

Later that year, Greene enlisted as a private in a Rhode Island militia company. When hostilities between Britain and the Colonies broke out at Lexington and Concord, Massachusetts, on April 19, 1775, Greene was suddenly elevated from the rank of private to brigadier general—doubtless a result of his political connections—and named commander of Rhode Island's force. Although he had begun as what his fel-

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low officer Henry Knox called, in a letter to a friend, "the rawest, the most untutored" of the Continental Army generals, he rapidly gained the respect of Washington, who considered Greene's men to be, he wrote, "under much better government than any around Boston." During the first year of the war, Washington came to regard Greene as his most dependable adviser and trusted officer, possessed not only with a superb grasp of military science but also an uncanny facility for assessing rapidly changing situations. By the fall of 1776, rumor had it that should anything happen to Washington, Congress would name Greene as his successor.

IT WAS WASHINGTON'S CONFIDENCE in Greene (who, since 1776, had fought in campaigns in New York, Pennsylvania and Rhode Island, and had served two years as the Continental Army's quartermaster general) that caused the commander in chief to turn to him as the war crisis deepened in the autumn of 1780. Greene was commander of the Continental installation at West Point when he learned of his appointment on October 15. He hastened to Preakness, New Jersey, where the Continental Army's main force was camped, to confer with Washington. Soon after Greene's departure from New Jersey, he received a letter in which Washington soberly advised: "I can give you no particular instructions but must leave you to govern yourself intirely [sic], according to your own prudence and judgment and the circumstances in which you find yourself." On December 2, Greene took command of what was left of Gates' army, in Charlotte, North Carolina—some 1,000 thin and hungry Continentals and 1,200 militiamen, all of them, Greene said, "destitute of every thing necessary either for the Comfort or Convenience of Soldiers." He told the governor of North Carolina, Abner Nash, that he had inherited "the Shadow of an Army, . . . a small force . . . very incompetent to give Protection" to the Carolinas. Greene, writing to Washington, assessed his prospects for success as "dismal, and truly distressing." But he knew that should he fail, the entire South, as his cavalry commander, Henry Lee, put it, "would be ground to dust" and face "reannexation to the mother country."

Greene's strategy was to lure the British ever deeper into the Carolinas. Ultimately, he wrote, he was not "without hopes of ruining Lord Cornwallis."

Greene was also fully aware that he faced a formidable British opponent. After the fall of Charleston in May 1780, Charles, Earl Cornwallis—usually referred to as Lord Cornwallis—had been ordered to pacify the remainder of South Carolina. The 42-year-old Cornwallis had fought against France in the Seven Years' War (1756-63) and had seen considerable action against the American rebels since 1776. Unassuming and fearless, the British general treated his men with compassion, but expected—and got—much from them in return. By early summer 1780, six months before Greene would arrive in Charlotte, Cornwallis' men had occupied a wide arc of territory, stretching from the Atlantic Coast to the western edge of South Carolina, prompting British headquarters in Charleston to announce that resistance in Georgia and South Carolina had been broken, save for "a few scattering militia." But the mission had not quite been accomplished.

Later that summer, backcountry patriots across South Carolina took up arms. Some of the insurgents were Scotch-Irish Presbyterians who simply longed to be free of British control. Others had been radicalized by an incident that had occurred in late May in the Waxhaws (a region below Charlotte, once home to the Waxhaw Indians). Cornwallis had detached a cavalry force under Lt. Col. Banastre Tarleton, by reputation hard and unsparing, to mop up the last remaining Continentals in that area, some 350 Virginians under Col. Abraham Buford. Tarleton's 270-man force had caught up with Buford's retreating soldiers on May 29 and

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quickly overwhelmed them. But when the Continentals called for quarter—a plea for mercy by men who had laid down their arms—Tarleton's troops hacked and bayoneted three-quarters of them to death. "The virtue of humanity was totally forgotten," a Loyalist witness, Charles Stedman, would recall in his 1794 account of the incident. From then on, the words "Bloody Tarleton" and "Tarleton's quarter" became a rallying cry among Southern rebels.

Following Buford's Massacre, as it soon came to be called, guerrilla bands formed under commanders including Thomas Sumter, Francis Marion and Andrew Pickens. Each had fought in South Carolina's brutal Cherokee War 20 years earlier, a campaign that had provided an education in irregular warfare. Soon, these bands were emerging from swamps and forests to harass redcoat supply trains, ambush forage parties and plunder Loyalists. Cornwallis issued orders that the insurgents would be "punished with the greatest vigour."

Two months of hard campaigning, however, failed to quash the insurgency. In late summer, Cornwallis, writing to Sir Henry Clinton, commander, in New York, of the British Army in North America, admitted that the backcountry was now "in an absolute state of rebellion." After acknowledging the risk entailed by expanding the war before the rebellion had been crushed, Cornwallis was nevertheless convinced, he informed Clinton, that he must invade North Carolina, which was "making great exertions to raise troops."

On January 17, American forces at Cowpens meadow—charging, in one rebel's words, like a "whirlwind"—routed the British.

In September 1780, Cornwallis marched 2,200 men north to Charlotte. Meanwhile, he dispatched 350 Loyalist militiamen under Maj. Patrick Ferguson, a 36-year-old Scotsman, to raise a force of Loyalists in western North Carolina. Ferguson was flooded with enlistments; his force tripled within two weeks. But backcountry rebels, also, were pouring in from the Carolinas, Georgia, Virginia and what is now eastern Tennessee. More than 1,000 rendezvoused at Sycamore Shoals in North Carolina, then set off after the Tories. They caught up with Ferguson in early October on King's Mountain, near the border between the Carolinas.

There Col. William Campbell, leader of the Virginians, a red-haired, 6-foot-6 giant married to the sister of firebrand patriot Patrick Henry, exhorted his men to "Shout like hell and fight like devils." Indeed, as the rebels hurtled up the steep hillside, they shrieked a hair-raising battle cry learned from Indian warriors. At the summit, they overwhelmed their foe, shouting "Buford! Buford! Tarleton's quarter!" The victors killed Ferguson and desecrated his body. Loyalists were slain after they surrendered. Altogether, more than 1,000 of them were killed or captured.

Upon hearing the news, Cornwallis, still in Charlotte, immediately retreated 60 miles south to Winnsboro, South Carolina. He remained there into December, when he learned that Greene had taken command of the tiny Continental Army and redeployed it to Hillsborough, North Carolina, roughly 165 miles northeast. Cornwallis knew that Greene possessed barely one-quarter the strength of the British force. Spies also informed him that Greene had made a potentially fatal blunder: he had divided his army in the face of a numerically superior foe.

In that audacious move, made, Greene said, "partly from choice and partly from necessity," he had given 600 men to Gen. Daniel Morgan, a tough former wagon master who had joined the army in 1775. After sending Morgan west of Charlotte, Greene marched the remainder of the force, 800 or so troops, toward the Pee Dee River, 120 miles to the east. His strategy was simple: if Cornwallis pursued Greene, Morgan could liberate British-held posts in western South Carolina; if the British went after Morgan, Greene wrote in a letter, there would be "nothing to obstruct" Greene's forces from attacking British posts in the backcountry outside Charleston. Other factors also figured into his unconventional plan. As his army, Greene wrote, was "naked & destitute of everything" and the countryside was in an "impoverished condition," he believed that "provisions could be had" more readily if one division operated in the east, the other in the west. Furthermore, the smaller armies could "move with great celerity," forcing the redcoats to give chase to one of them, and, Greene hoped, exhaust themselves.

But Cornwallis also divided *his* force. He dispatched Tarleton with 1,200 men to destroy Morgan, while he set off after Greene with 3,200 troops. Within a week, Tarleton caught up with Morgan, who had fallen back, buying time for the arrival of reinforcements and scouting for the best place to fight. He chose Cowpens, a meadow 25 miles west of King's Mountain. By the time Morgan positioned his army there, his force had swelled to 1,000.

Near 6:00 a.m. on January 17, Tarleton's men splashed across Macedonia Creek, pushing to the edge of the meadow, moving, an American soldier later recalled, "as if certain of

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victory." Tarleton's force advanced the length of two football fields in three minutes, huzzahing as they came, drums beating, fifes sounding, sunlight gleaming off bayonets, "running at us as if they Intended to eat us up," Morgan would write a few days later. He ordered his forward line to open fire only when the British had closed to within 35 yards; at that instant, as one American soldier wrote in a letter home, a "sheet of flame from right to left" flashed toward the enemy.

After three such volleys, the Americans retreated. Believing the militiamen to be fleeing, Tarleton's men surged after them, only to run into a fourth deadly volley, laid down by Continentals posted in a second line behind the militiamen. Morgan then unleashed his cavalry, which materialized from behind a ridge; the horsemen, slashing with their sabers, bellowed "Tarleton's quarter." The "shock was so sudden and violent," one rebel would recall, that the British quickly retreated. Many threw down their weapons and ran, said another, "as hard . . . as a drove of wild Choctaw steers." About 250 of the British, including Tarleton, escaped. Many of those who could not flee fell to their knees, pleading for their lives: "Dear, good Americans, have mercy on us! It has not been our fault, that we have SKIVERED so many." The cavalrymen showed little mercy, an American, James Collins, reported later in his memoirs, attacking both armed and unarmed men, sweeping the battlefield like a "whirlwind."

THEY CAME, DRUMS BEATING, FIFES SOUNDING, SUNLIGHT GLEAMING OFF BAYONETS, "RUNNING AT US AS IF THEY INTENDED TO EAT US UP."

While 73 of Morgan's rebels were killed, Tarleton had lost nearly everything. More than 100 British corpses littered the battlefield. Another 800 soldiers, a quarter of them wounded, had been captured, along with artillery, ammunition and baggage wagons. Morgan was euphoric. He swept up his 9-year-old drummer, kissed him on both cheeks, then cantered across the battlefield shouting: "Old Morgan never was beaten." Tarleton, he crowed, had been dealt "a devil of a whipping."

When Cornwallis learned of the rout at Cowpens the following day, January 18, he took the news badly. One witness, an anonymous American prisoner of war, reported that the general leaned "forward on his sword. . . . Furious at what he heard, Cornwallis pressed so hard that the sword snapped in two, and he swore loudly." Now Cornwallis decided to go after Morgan, then hunt down Greene. After a five-day march, Cornwallis and nearly 3,000 men reached Ramsour's Mill in North Carolina. There he learned that Morgan was a mere 20 miles ahead of him. Cornwallis stripped his army of anything that might slow it down, burning nearly his entire baggage train—tents, wagons, luxury goods—in a giant bonfire.

Morgan's scouts reported this development. "I know thay [sic] intend to bring me to an action, which I carefully [plan] to avoid," Morgan wrote to Greene, informing him also that Cornwallis enjoyed a two-to-one numerical superiority. Though Morgan had gotten a considerable head start, he now paused to await orders from Greene after crossing the Catawba River on January 23. He was still there five days later when he learned that the enemy had closed to within ten miles. "I am a little apprehensive," Morgan confessed in a dispatch to Greene, as "my numbers . . . are too weak to fight them. . . . It would be advisable to join our forces." Cornwallis' army reached the opposite shore of the Catawba later that day. But the gods of war were with Morgan. It began to rain. Hour after hour it poured, transforming the river into a raging, impassable barrier. Cornwallis was stopped in his tracks for nearly 60 hours.

Greene had not learned of Cowpens until January 24, and while the news set off a great celebration at his headquarters, two more days passed before he discovered that Morgan had lingered at the Catawba awaiting orders. Greene sent most of his men toward the relative safety of Salisbury, 30 miles east of the Catawba, then, accompanied only by a handful of guards and his small staff, set off to join Morgan, riding 80 mud-splattered miles through Tory-infested territory. As he rode, Greene considered his options: make a stand against Cornwallis at the Catawba or order Morgan's men to retreat east and link up with their comrades near Salisbury. His decision, Greene concluded, would depend on whether sufficient reinforcements from local militias had marched to Morgan's aid.

But when he reached Morgan on January 30, Greene learned that a mere 200 militiamen had turned up. Incensed, he immediately wrote Congress that despite his appeal for reinforcements, "little or nothing is done. . . . Nothing can save this country but a well appointed army." Greene ordered a retreat to the village of Guilford Courthouse, North Carolina, 75 miles east. He also requisitioned "vessels and watermen" to transport his army across the rivers that lay ahead and appealed to civil authorities for reinforcements. "Great god what is the reason we cant Have more men," he wrote in frustration to Thomas Jefferson, then governor of Virginia.

If enough soldiers arrived by the time his combined armies reached Guilford Courthouse, Greene could engage Cornwallis. If not, he would continue north toward the Dan River, cross into Virginia and await additional troops there. Greene preferred to fight, but he saw too that his retreat was drawing Cornwallis ever deeper into the interior, farther and farther from reinforcements, compelling the British to forage for every scrap of food. And, since the bonfire at Ramsour's Mill, the redcoats had been without

tents and sufficient winter clothing. Greene hoped that the cold weather and arduous marches over roads that rain had turned into quagmires would further weaken them.

Greene set out on January 31, but without Morgan. Since the previous fall the subordinate had suffered back problems; now, Morgan said, "a ciatick pain in my hip . . . renders me entirely [in]capable of active services." Greene sent him ahead, to join the contingent of British prisoners from Cowpens being marched to Winchester, Virginia. Greene took command of Morgan's men, pointed that force toward the Yadkin River, seven miles beyond Salisbury, and hoped that transport vessels awaited them.

Only 12 hours after Greene had crossed the Catawba, Cornwallis, too, began to move his army across it. Lacking boats and facing a raging current, the British had to wade across the numbingly cold, four-foot-deep river, while Greene's rear guard—North Carolina militiamen—poured a steady fire into their ranks. Cornwallis himself had his horse shot from under him. "I saw 'em a snortin, a hollerin and a drownin," wrote a Tory. By the time the last of Cornwallis' men made it across the 500-yard-wide river, Greene had increased his lead to 30 miles.

Cornwallis pressed on, hoping the rain—his enemy at the Catawba—would prove his ally at the Yadkin; if it persisted, the rebels might be trapped. Having kept the hundreds of horses he had used to pull supply wagons, he ordered two redcoats astride each mount; the entire force pressed forward through the mud, closing in on their quarry. Greene reached the Yadkin first, where he indeed found boats awaiting him. But just as Cornwallis had hoped, Greene faced a river roiling with floodwaters. To attempt a crossing would be hazardous; yet to stand and fight, backed against the river, would be madness. Greene ordered his army into the vessels. It was a harrowing crossing; the boats nearly capsized and Greene himself barely made it across. His rear guard exchanged shots with Cornwallis' vanguard. But for the British, crossing without vessels was unthinkable. For the second time in a week, Cornwallis had been stopped by a rampaging river.

Marching under threatening skies, the Americans now hurried to Guilford Courthouse. There, at last, the two divisions of Greene's army, separated since before Christmas, were reunited. Greene convened a council of war to decide whether to fight or retreat into Virginia. His officers, knowing their force to be outnumbered by at least 1,000, voted unanimously "to avoid a general Action at all Events" and to fall back.

Cornwallis, meanwhile, cooled his heels waiting—for five long days—to cross the Yadkin. His men were bone-tired, but the general was a man possessed. If he could destroy Greene, not a single Continental soldier would remain south of Virginia. Cornwallis envisioned then taking his army into Virginia, where he would cut supply lines to guerrillas in the Carolinas and Georgia. He was convinced that once partisans there were denied the stores that were their lifeblood, they could not hold out. The consummation of Britain's Southern Strategy, Cornwallis believed, lay within his grasp. Once again, he pressed on. But Greene was no less determined. He told North Carolina's governor that although "evils are now fast approaching," he was "not without hopes of ruining Lord Cornwallis."

The final leg of the chase began on February 10, as the redcoats, chilled to the bone, doggedly moved out. The next day, Greene, who was 25 miles ahead at Guilford Courthouse, set out for Boyd's Ferry, on the Dan River. Greene knew he must stay ahead. "Our force is so unequal to the enemy, as well in numbers as condition," he wrote, that fighting Cornwallis would mean "inevitable ruin to the Army."

Again, Greene divided his army. He replaced the incapacitated Morgan with Col. Otho Williams, a 32-year-old former civil servant from Frederick, Maryland, who had fought in Canada and New York. Williams was to take 700 men and head northwest, as if he planned to cross the Dan at its upper fords. Greene, commanding a larger division of some 1,300 men, would stay to the east, marching directly for a downstream crossing. Williams made every minute count. He woke his men each morning at 3:00, marching them four hours before pausing for a hurried breakfast. He did not give them another break until after nightfall, when they were allotted six hours for supper and sleep.

GREENE ORDERED HIS ARMY INTO THE VESSELS. IT WAS A HARROWING CROSSING; THE BOATS NEARLY CAPSIZED AND GREENE HIMSELF BARELY MADE IT ACROSS.

But if the rebels moved quickly, Cornwallis moved even faster. By February 13, he had cut the gap with Williams to a mere four miles. Though Cornwallis knew he could not catch Greene's forces before they reached the Dan, he believed he could pinion Williams at the river and deliver a fatal blow. Spies had reported that Williams had no boats.

But Cornwallis had been hoodwinked. With the redcoats running hard on his heels, Williams suddenly veered, as planned, toward Greene and Boyd's Ferry. Greene, who had ordered vessels readied at that site, reached the river the next day, February 14, and crossed. He immediately wrote Williams: "All our troops are over. . . . I am ready to receive you and give you a hearty welcome." Williams reached the Dan just after nightfall the next day. Ten hours later, in the tilting red light of sunrise on February 16, Cornwallis arrived just in time to witness the last rebel soldier step ashore on the far side of the Dan.

The chase had ended. Greene's men had marched 200 miles and crossed four rivers in less than 30 days, waging a

campaign that even Tarleton later praised as "judiciously designed and vigorously executed." Cornwallis had lost one-tenth of his men; the remainder had been exhausted by their punishing, and fruitless, exertions. Ordering an end to the pursuit, he issued a proclamation claiming victory, on the grounds that he had driven Greene's army from North Carolina. Cornwallis then retreated to Hillsborough, 65 miles south.

But Greene had not given up the fight. Only eight days after crossing the Dan and longing to achieve a resounding victory, he returned to North Carolina with 1,600 men. As Greene headed toward Hillsborough, members of his cavalry, commanded by Col. Henry Lee, surprised an inexperienced band of Tory militiamen under Col. John Pyle, a Loyalist physician. In an action disturbingly similar to Tarleton's Waxhaws massacre, Lee's men slaughtered many of the Loyalists who had laid down their arms. American dragoons killed 90 and wounded most of the remaining Tories. Lee lost not a single man. When he heard the news, Greene, grown hardened by the war, was unrepentant. The victory, he said, "has knocked up Toryism altogether in this part" of North Carolina.

Cornwallis was now more eager than ever to engage Greene, who had halted to wait for reinforcements. Initially, Cornwallis had held a numerical advantage, but he could not replace his losses; after Pyles' Massacre, the recruitment of Loyalists virtually ceased. The rebel force, meanwhile, grew steadily as militia and Virginia Continentals arrived. By the second week in March, Greene possessed nearly 5,000 men, approximately twice Cornwallis' force.

Greene (above), crossing the Dan River, outwitted Cornwallis—who had no boats. "All our troops are over," Greene exulted.

Greene chose to meet Cornwallis near Guilford Courthouse, at a site he described as "a Wilderness" interspersed with "a few cleared fields." The thickly forested terrain, he thought, would make it difficult for the British to maintain formation and mount bayonet charges. He positioned his men much as Morgan had done at Cowpens: North Carolina militiamen were posted in the front line and ordered to fire three rounds before they fell back; a second line, of Virginia militiamen, would do the same, to be followed by a third line of Continentals. Around noon on March 15, a mild spring day, the rebels glimpsed the first column of red-clad soldiers emerging through a stand of leafless trees.

The battle was bloody and chaotic, with fierce encounters among small units waged in wooded areas. Ninety minutes into it, the British right wing was continuing to advance, but its left was fraying. An American counterattack might have turned the battle into a rout. But Greene had no cavalry in reserve, nor could he be sure that his militiamen had any fight left in them. He halted what he would later call the "long, bloody, and severe" Battle of Guilford Courthouse, convinced that his troops had inflicted sufficient losses. Cornwallis had held the field, but he had lost nearly 550 men, almost twice the American casualties. The "Enemy got the ground," Greene would write to Gen. Frederick Steuben, "but we the victory."

A decisive triumph had eluded Greene, but the heavy attrition suffered by the British—some 2,000 men lost between January and March—led Cornwallis to a fateful decision. Convinced it would be futile to stay in the Carolinas, where he would have to either remain on the defensive or resume an offense that promised only further "desultory expeditions" in "quest of adventures," Cornwallis decided to march his army into Virginia. His best hope of turning the tide, he concluded, was to win a "war of conquest" there. Greene allowed him to depart unimpeded, leading his own forces south to liberate South Carolina and Georgia.

Although Greene reentered South Carolina with only 1,300 men (most of his militia had returned home) to oppose nearly 8,000 redcoats there and in Georgia, the British were scattered across the region, many in backcountry forts of between 125 and 900 men. Greene took them on systematically. By the end of the summer, the backcountry had been cleared of redcoats; Greene announced that no "further ravages upon the Country" were expected. What was left of the British Army was holed up in Savannah and Charleston.

JUST NINE MONTHS EARLIER, it had appeared that the Carolinas and Georgia were lost, leaving the fledgling nation—if it even survived—as a fragile union of no more than ten states. Greene's campaign had saved at least three Southern states. Now Cornwallis' presence in Virginia gave General Washington and America's ally, France, the possibility of a decisive victory.

GRANGER COLLECTION

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In August, Washington and his French counterpart, Comte de Rochambeau, learned that a French fleet under Comte de Grasse had sailed from the Caribbean for the Chesapeake with 29 heavy warships and 3,200 troops. Both men knew that Cornwallis' army had camped at Yorktown, on the peninsula below Richmond, near de Grasse's destination. While Franco-American forces headed south from New York, Washington asked the Marquis de Lafayette and his Continental forces to confine Cornwallis to the peninsula. When the combined allied armies arrived outside Yorktown in late September, they found that Lafayette had hemmed in Cornwallis and that de Grasse's fleet had prevented the Royal Navy from entering the Chesapeake and rescuing the beleaguered redcoats.

Cornwallis was trapped. His 9,000 men faced an enemy of 7,800 French soldiers, 8,000 Continentals and 3,100 American militiamen. One American soldier noted that the allies had "holed [Cornwallis] and nothing remained but to dig him out." The allies mounted a siege. Cornwallis held out for three grim weeks, but by mid-October, with disease breaking out in the ranks and his men on half-rations, he opened surrender negotiations. Two days later, on October 19, under a clear autumn sky, Cornwallis' soldiers emerged from the village of Yorktown, marching between a long line of French on their left and Americans on their right, to lay down their arms. It was the decisive outcome Washington had long sought, setting in motion the negotiations that eventually resulted in Britain's recognition of American independence.

In the wake of Cornwallis' surrender, General Washington congratulated the army for "the glorious event" that would bring "general Joy" to "every Breast" in the United States. To General Clinton in New York, Cornwallis wrote: "I have the mortification to inform Your Excellency that I have been forced to . . . surrender the troops under my command." Pleading illness, he did not attend the surrender ceremony.

Washington understood that Greene's campaign had saved the American Revolution. In December, he told Greene that there "is no man . . . that does not allow that you have done great things with little means." To "save and serve the Country" was the most noble of attainments, Thomas Paine informed Greene. General Knox declared that Greene, without "an army, without Means, without anything has performed Wonders." No tribute was more important to Greene than the award of a Congressional Medal, bearing his likeness on one side, under the epigraph "The Distinguished Leader"; the reverse was inscribed with a Latin phrase that translated: "The Safety of the Southern Department. The Foe conquered. . . . "

On October 19, Cornwallis, trapped at Yorktown (above), surrendered. The news, wrote Washington, was greeted with "general Joy."

Greene said little of his own achievements, preferring instead to express his gratitude to his men. When he at last left the army in July 1783, Green praised his "illustrious" soldiers: "No Army," he proclaimed, "ever displayed so much obedient fortitude because No army ever suffered such variety of distresses."

At first, when Greene retired from military service, he divided his time between Newport, Rhode Island, and Charleston, South Carolina. The state of Georgia, as a token of gratitude for his role in liberating the South, had given Greene a rice plantation, Mulberry Grove, outside Savannah. In the autumn of 1785, he and Catherine moved to the estate. However, they lived there for only eight months before Greene died, either of an infection or sunstroke, on June 19, 1786. He was 43 years old.

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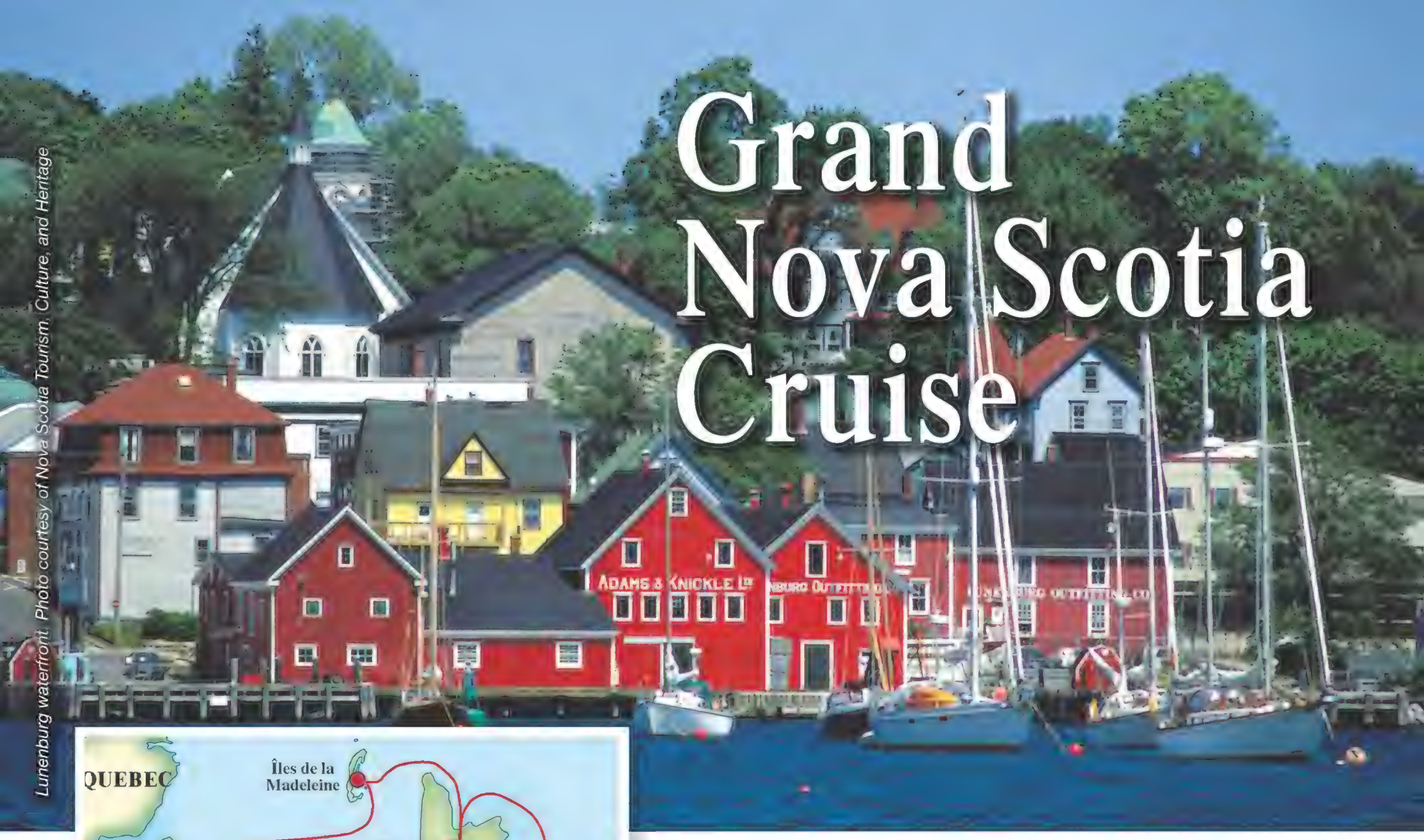

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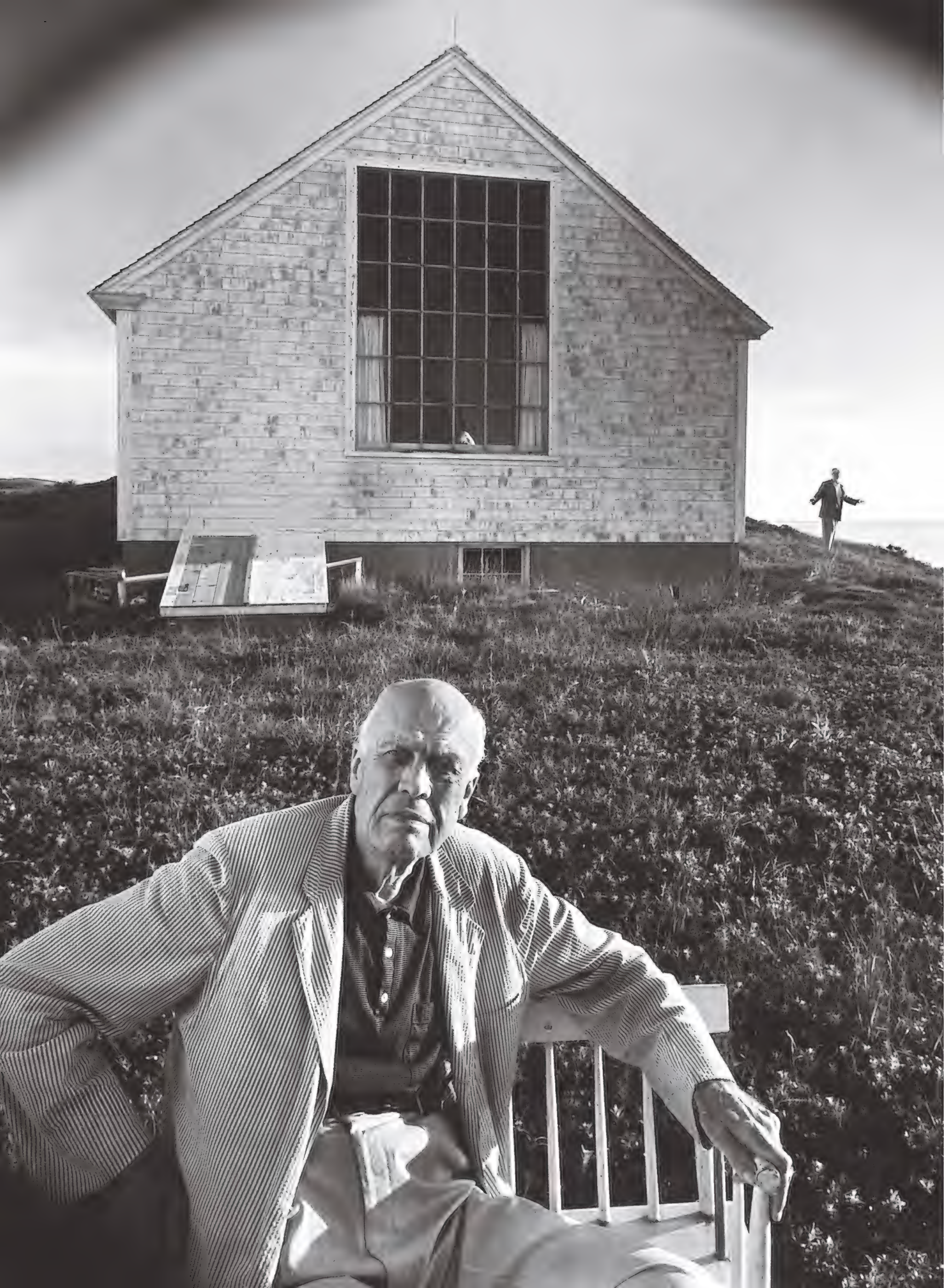

HOPPER

Mystery. Longing. A whole new way of seeing. A stunning retrospective reminds us why the enigmatic American artist retains his power

BY AVIS BERMAN

PAINTING DID NOT COME EASILY TO EDWARD HOPPER. Each canvas represented a long, morose gestation spent in solitary thought. There were no sweeping brushstrokes from a fevered hand, no electrifying eurekas. He considered, discarded and pared down ideas for months before he squeezed even a drop of paint onto his palette. In the early 1960s, the artist Raphael Soyer visited Hopper and his wife, Josephine, in their summer house on a bluff above the sea in Cape Cod. Soyer found Hopper sitting in front gazing at the hills and Jo, as everyone called her, in back, staring in the opposite direction. "That's what we do," she said to Soyer. "He sits in his spot and looks at the hills all day, and I look at the ocean, and when we meet there's controversy, controversy, controversy." Expressed with Jo's characteristic flash (an artist herself and once an aspiring actress, she knew how to deliver a line), the vignette summarizes both Hopper's creative process and the couple's fractious yet enduring relationship. Similarly, Hopper's close friend, American painter and critic Guy Pène du Bois, once wrote that Hopper "told me . . . that it had taken him years to bring himself into the painting of a cloud in the sky."

For all his cautious deliberation, Hopper created more than 800 known paintings, watercolors and prints, as well as numerous drawings and illustrations. The best of them are uncanny distillations of New England towns and New York City architecture, with exact time and place arrested. His stark yet intimate interpretations of American life, sunk in shadow or broiling in the sun, are minimal dramas suf-

"I've always been intrigued by an empty room," Hopper (left, in 1960 at his Cape Cod home, with wife, Jo, in background) once said. His 1951 painting *Rooms by the Sea* (right), both abstract and surreal, evokes a feeling of mystery and solitude.

YALE UNIVERSITY ART GALLERY / ART RESOURCE; P. 56 ARNOLD NEWMAN / GETTY IMAGES

Hopper (left, in his 40s, in a 1925-30 self-portrait) depicted his wife, artist Josephine Nivison, at age 53, in a 1936 painting (right).

fused with maximum power. Hopper had a remarkable ability to invest the most ordinary scene—whether at a roadside gas pump, a nondescript diner or a bleak hotel room—with intense mystery, creating narratives that no viewer can ever quite unravel. His frozen and isolated figures often seem awkwardly drawn and posed, but he eschewed making them appear too graceful or showy, which he felt would be false to the mood he sought to establish. Hopper's fidelity to his own vision, which lingered on the imperfections of human beings and their concerns, made his work a byword for honesty and emotional depth. Critic Clement Greenberg, the leading exponent of Abstract Expressionism, saw the paradox. Hopper, he wrote in 1946, "is not a painter in the full sense; his means are secondhand, shabby, and impersonal." Yet Greenberg was discerning enough to add: "Hopper simply happens to be a bad painter. But if he were a better painter, he would, most likely, not be so superior an artist."

Hopper was as pensive as the people he put on canvas. Indeed, the enigmatic quality of the paintings was enhanced by the artist's public persona. Tall and solidly built with a massive balding head, he reminded observers of a piece of granite—and was about as forthcoming. He was unhelpful to journalists seeking details or anecdotes. "The whole answer is there on the canvas," he would stubbornly reply. But he also said, "The man's the work. Something doesn't come out of nothing." The art historian Lloyd Goodrich, who championed Hopper in the 1920s, thought that the artist and his work coalesced. "Hopper had no small talk," Goodrich wrote. "He was famous for his monumental silences; but like the spaces in his pictures, they were not empty. When he did speak, his words were the product of long meditation. About the things that interested him, especially art . . . he had perceptive things to say, expressed tersely but with weight and exactness, and uttered in a slow reluctant monotone."

As to controversy, there is little left anymore. Hopper's star has long blazed brightly. He is arguably the supreme American realist of the 20th century, encapsulating aspects of our experience so authentically that we can hardly see a tumbledown house near a deserted road or a shadow slipping across a brownstone facade except through his eyes. Given Hopper's iconic status, it is surprising to learn that no comprehensive survey of his work has been seen in American museums outside New York City in more than 25 years. This drought has been remedied by "Edward Hopper," a retrospective currently at the Museum of Fine Arts, Boston through August 19 and continuing on to Washington, D.C.'s National Gallery of Art (Sept. 16, 2007-Jan. 21, 2008) and the Art Institute of Chicago (Feb. 16-May 11,

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AVIS BERMAN *is the author of* Edward Hopper's New York *and the editor of* My Love Affair with Modern Art: Behind the Scenes with a Legendary Curator *by Katharine Kuh (2006).*

WHITNEY MUSEUM OF AMERICAN ART, JOSEPHINE N. HOPPER BEQUEST / PHOTOGRAPHY BY ROBERT E. MATES / COURTESY, MUSEUM OF FINE ARTS, BOSTON; WHITNEY MUSEUM, NY

2008). Consisting of more than 100 paintings, watercolors and prints, most of them dating from roughly 1925 to 1950, the period of the artist's greatest achievement, the show spotlights Hopper's most compelling compositions.

"The emphasis is on connoisseurship, an old-fashioned term, but we selected rigorously," says Carol Troyen, a curator of American painting at the Museum of Fine Arts, Boston and one of the organizers—along with the Art Institute's Judith Barter and the National Gallery's Franklin Kelly—of the exhibition. "Hopper is recognized as a brilliant creator of images, but we also wanted to present him as an artist dedicated to the craft of painting whose work must be seen in person. His art is far more subtle than any reproduction reveals."

EDWARD HOPPER WAS BORN July 22, 1882, in Nyack, New York, 25 miles north of New York City, into a family of English, Dutch, French and Welsh ancestry. His maternal grandfather built the house—preserved today as a landmark and community art center—where he and his sister, Marion, who was two years older, grew up. Hopper's father, Garrett Henry Hopper, was a dry goods merchant. His mother, Elizabeth Griffiths Smith Hopper, enjoyed drawing, and both his parents encouraged their son's artistic inclinations and preserved his early sketches of himself, his family and the local countryside. Gangling and self-effacing, Edward, who was over six feet tall at age 12, was teased by his classmates. His differentness probably reinforced solitary pursuits—he gravitated to the river, to sketching, to sailing and to painting. Even as a child, Hopper recalled, he noticed "that the light on the upper part of a house was different than that on the lower part. There is a sort of elation about sunlight on the upper part of a house."

Although Hopper's parents recognized their son's gifts and let him study art, they were prudent enough to require that he specialize in illustration as a way to make a living. After graduating from high school in 1899, Hopper enrolled in a commercial art school in New York City and stayed there about a year, after which he transferred to the New York School of Art, founded in 1896 by the American Impressionist William Merritt Chase. Hopper continued to study illustration but also learned to paint from the most influential teachers of the day, including Chase, Robert Henri and Kenneth Hayes Miller. Both Chase and Henri had been influenced by Frans Hals, Velázquez and French Impressionism, particularly as exemplified by Édouard Manet. Henri encouraged his students to emancipate themselves from tired academic formulas, espousing a realism that plunged into the seamier aspects of American cities for its subject matter. As a successful artist looking back, Hopper had reservations about Henri as a painter, but he always granted that his teacher was a vigorous advocate for an enlightened

The watercolors Hopper created in Massachusetts in the 1920s led to his first professional recognition; below, *House and Harbor* (1924).

PRIVATE COLLECTION / COURTESY, MUSEUM OF FINE ARTS, BOSTON

way of seeing. Inspired by Henri's motivating force, the youthful Hopper stayed on at the school for six years, drawing from life and painting portraits and genre scenes. To support himself, he taught art there and also worked as a commercial artist. Hopper and his friend Rockwell Kent were both in Miller's class, and some of their early debates turned on painterly problems that remained of paramount fascination for Hopper. "I've always been intrigued by an empty room," he remembered. "When we were at school . . . [we] debated what a room looked like when there was nobody to see it, nobody looking in, even." In an empty room absence could suggest presence. This idea preoccupied Hopper for his entire life, from his 20s through his last years, as is evident in *Rooms by the Sea* and *Sun in an Empty Room*, two majestic pictures from the 1950s and '60s.

Another essential part of a budding artist's education was to go abroad. By saving money from his commercial assignments, Hopper was able to make three trips to Europe between 1906 and 1910. He lived primarily in Paris, and in letters home he rhapsodized about the beauty of the city and its citizens' appreciation of art.

Despite Hopper's enjoyment of the French capital, he registered little of the innovation or ferment that engaged other resident American artists. At the time of Hopper's first visit to Paris, the Fauves and the Expressionists had already made their debuts, and Picasso was moving toward Cubism. Hopper saw memorable retrospectives of Courbet, whom he admired, and Cézanne, about whom he complained. "Many Cézannes are very thin," he later told writer and artist Brian O'Doherty. "They don't have weight." In any case, Hopper's own Parisian pictures gave intimations of the painter he was to become. It was there that he put aside the portrait studies and dark palette of the Henri years to concentrate on architecture, depicting bridges and buildings glowing in the soft French light.

After returning to the United States in 1910, Hopper never visited Europe again. He was set on finding his way as

In *New York Corner* (below), 1913, Hopper introduced a motif of red-brick buildings and a pattern of opened and closed windows.

an American, and a transition toward a more individual style can be detected in *New York Corner* (left), painted in 1913. In that canvas, he introduces the motif of red-brick buildings and the rhythmic fugue of opened and closed windows that he would bring to a sensational pitch in the late 1920s with *The City*, *From Williamsburg Bridge* and *Early Sunday Morning*. But *New York Corner* is transitional; the weather is misty rather than sunny, and a throng uncharacteristically congregates in front of a stoop. When asked years later what he thought of a 1964 exhibition of artist Reginald Marsh's work, the master of pregnant, empty spaces replied, "He has more people in one picture than I have in all my paintings."

In December 1913, Hopper moved from Midtown to Greenwich Village, where he rented a high-ceilinged, top-floor apartment at 3 Washington Square North, a brick

LOWER LEFT: PRIVATE COLLECTION, COURTESY FRAENKEL GALLERY AND MARTHA PARRISH & JAMES REINISH, INC. / COURTESY, MUSEUM OF FINE ARTS, BOSTON

Hopper used his red-brick-rhythmic-window motif in *Early Sunday Morning* (1930) to create a sense of familiarity and eerie silence.

PP. 60-61 WHITNEY MUSEUM OF AMERICAN ART / PHOTOGRAPH BY STEVEN SLOMAN / COURTESY, MUSEUM OF FINE ARTS, BOSTON

town house overlooking the storied square. The combined living and work space was heated by a potbellied stove, the bathroom was in the hall, and Hopper had to climb four flights of stairs to fetch coal for the stove or pick up the paper. But it suited him perfectly.

Hopper sold one painting in 1913 but didn't make another major sale for a decade. To support himself, he continued to illustrate business and trade journals, assignments he mostly detested. In 1915 he took up printmaking as a way to remain engaged as an artist. His etchings and drypoints found greater acceptance than his paintings; and at $10 to $20 each, they occasionally sold. Along with the bridges, buildings, trains and elevated railroads that already were familiar elements in his work, the prints feature a bold development: Hopper began portraying women as part of the passing scene and as the focus of male longing. The etching *Night on the El Train* is a snapshot of a pair of lovers oblivious to everyone else. In *Evening Wind*, a curvaceous nude climbs onto a bed on whose other side the artist seems to be sitting as he scratches a lovely chiaroscuro moment into a metal plate. In these etchings, New York is a nexus of romantic possibilities, overflowing with fantasies tantalizingly on the brink of fulfillment.

Between 1923 and 1928, Hopper often spent time during the summer in Gloucester, Massachusetts, a fishing village and art colony on Cape Ann. There he devoted himself to watercolor, a less cumbersome medium that allowed him to work outdoors, painting humble shacks as well as the grand mansions built by merchants and sea captains. The watercolors marked the beginning of Hopper's real professional recognition. He entered six of them in a show at the Brooklyn Museum in November 1923. The museum

The intriguing *Night Windows* (1928) is at once voyeuristic and mysterious; one can only guess at what the woman is up to.

bought one, *The Mansard Roof*, a view of an 1873 house that showcases not only the structure's solidity, but the light, air and breeze playing over the building. A year later, Hopper sent a fresh batch of Gloucester watercolors to New York dealer Frank Rehn, whose Fifth Avenue gallery was devoted to prominent American painters. After Rehn mounted a Hopper watercolor show in October 1924 that was a critical and financial smash, the artist quit all commercial work and lived by his art for the rest of his life.

HOPPER'S CAREER as a watercolorist had been jumpstarted by the encouragement of Josephine Verstille Nivison, an artist whom Hopper had first courted in 1923 in Gloucester. The two wed in July 1924. As both were over 40, with established living habits, adjusting to each other took some effort. Their marriage was close—Josephine moved into her husband's Washington Square quarters and did not have a separate work space for many years—and turbulent, for they were physical and temperamental opposites. Towering over her, he was stiff-necked and slow-moving; she was small, snappy and birdlike, quick to act and quicker to speak, which some said was constantly. Accounts of Jo Hopper's chattering are legion, but her vivacity and conversational ease must have charmed her future husband, at least initially, for these were traits he lacked. "Sometimes talking with Eddie is just like dropping a stone in a well," Jo quipped, "except that it doesn't thump when it hits bottom." As time passed, he tended to disregard her; she resented him. But Hopper probably could not have tolerated a more conventional wife. "Marriage is difficult," Jo told a friend. "But the thing has to be gone through." To which Hopper retorted, "Living with one woman is like living with two or three tigers." Jo kept her husband's art ledgers, guarded against too many guests, put up with his creative dry spells and put her own life on hold when he roused himself into working. She posed for nearly every female figure in his canvases, both for his convenience and her peace of mind. They formed a bond that only Edward's death, at age 84, in 1967 would break. Jo survived him by just ten months, dying 12 days before her 85th birthday.

Jo Hopper's availability as a model likely spurred her husband toward some of the more contemporary scenes of

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"The painter," Hopper often observed, "paints to reveal himself through what he sees in his subject." *Chop Suey* dates from 1929.

women and couples that became prominent in his oils of the mid- and late 1920s and gave several of them a Jazz Age edge. In *Automat* and *Chop Suey* (above), smartly clothed independent women, symbols of the flapper era, animate a heady cosmopolitan milieu. *Chop Suey* had an especially personal meaning for the Hoppers—the scene and the place derive from a Columbus Circle Chinese restaurant where they often ate during their courtship.

Hopper ignored much of the city's hurly-burly; he avoided its tourist attractions and landmarks, including the skyscraper, in favor of the homely chimney pots rising on the roofs of commonplace houses and industrial lofts. He painted a number of New York's bridges, though not the most famous, the Brooklyn Bridge. He reserved his greatest affection for unexceptional 19th- and early 20th-century structures. Echoing his Gloucester watercolors (and decades ahead of the historic preservation movement), he treasured vernacular buildings, drawing satisfaction from things that stayed as they were.

By the late 1920s, Hopper was in full command of a powerful urban vision. He had completed several extraordinary paintings that seemed almost carved out of the materials they were depicting, brick by brick and rivet by rivet. *Manhattan Bridge Loop* (1928) and *Early Sunday Morning* (1930) match the monumental scale of New York itself, whereas *Night Windows* (1928) acknowledges in an almost cinematic way the strange nonchalance that results from lives lived in such close proximity: even when you think you are alone, you are observed—and accept the fact. The unsettling nature of *Night Windows* derives from the position of the viewer—directly across from a half-dressed woman's derrière. The painting suggests that Hopper may have affected movies as much as they affected him. When German director Wim Wenders, a Hopper fan, was asked why the artist appeals to so many filmmakers, he said: "You can always tell where the camera is."

With the creation of such distinctive paintings, Hopper's reputation soared. *Two on the Aisle* sold in 1927 for $1,500, and *Manhattan Bridge Loop* brought $2,500 in 1928. That same year, Frank Rehn took in more than $8,000 for Hopper's oils and watercolors, which yielded the artist about $5,300 (more than $64,000 today). In January 1930, *House by the Railroad* became the first painting by any artist to

Hopper "offers slices of an insoluble life, moments in a narrative that can have no closure," wrote art critic Robert Hughes. Hopper painted *Cape Cod Morning*, which he said came nearer to what he felt than some other works, in 1950.

enter the permanent collection of New York's newly established Museum of Modern Art. Later that year, the Whitney Museum of American Art bought *Early Sunday Morning* for $2,000; it would become a cornerstone of that new institution's permanent collection. The august Metropolitan Museum of Art purchased *Tables for Ladies* for $4,500 in 1931, and in November 1933, the Museum of Modern Art gave Hopper a retrospective exhibition, an honor rarely bestowed on living American artists. He was 51.

Since 1930, the Hoppers had spent summer vacations in South Truro, Massachusetts, near the tip of Cape Cod. A small town situated between Wellfleet and Provincetown, Truro had kept its local character. In 1933 Jo received an inheritance, which the couple used to build a house there; it was completed the next year. The Hoppers would spend nearly every summer and early autumn in Truro for the remainder of their lives.

By the end of the 1930s, Hopper had changed his working methods. More and more, instead of painting outside, he stayed in his studio and relied on synthesizing remembered images. He pieced together *Cape Cod Evening* (1939) from sketches and recollected impressions of the Truro vicinity—a nearby grove of locust trees, the doorway of a house miles away, figures done from imagination, dry grass growing outside his studio. In the painting, a man and woman seem separated by their own introspection. Hopper's "equivocal human figures engaged in uncertain relationships mark his paintings as modern" as strongly as his gas pumps and telephone poles, writes art historian Ellen E. Roberts in the current show's catalog.

The notions of disconnection and inaccessiblity are most fully realized in *Nighthawks* (1942), Hopper's most famous painting. Like the *Mona Lisa* or *Whistler's Mother* or *American Gothic*, it has taken on a life of its own in popular culture, with its film-noir sensibility sparking scores of parodies. The figures, customers at a late-night eatery, flooded by an eerie greenish light, look like specimens preserved in a jar. Hopper has banished every superfluous detail: the huge plate-glass window is seamless, and there is no visible entrance to the restaurant. Like characters in a crime movie or existential novel, the figures seem trapped in a world that offers no escape.

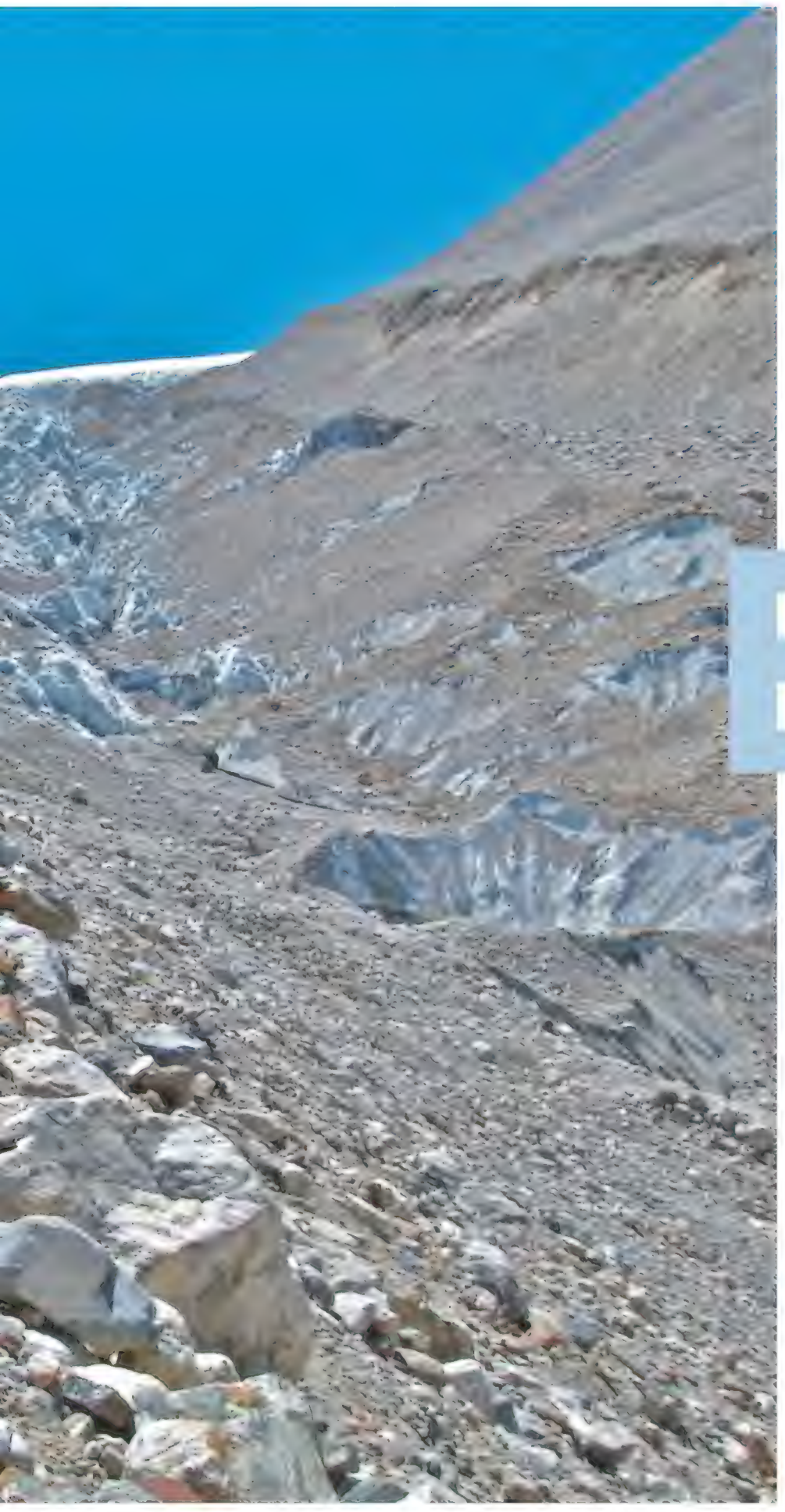
As Hopper aged, he found it increasingly difficult to work, and as his output decreased in the late 1940s, some critics labeled him as passé. But younger artists knew better. Richard Diebenkorn, Ed Ruscha, George Segal, Roy Lichtenstein and Eric Fischl appropriated Hopper's world and made it their own. Eight decades after his most evocative canvases were painted, those silent spaces and uneasy encounters still touch us where we are most vulnerable. Edward Hopper, matchless at capturing the play of light, continues to cast a very long shadow.

For additional images and other Hopper happenings, visit Smithsonian.com.

CHRONICLING

"What really stands out is how unusual

THE ICE



Long before global warming became a cause célèbre, Lonnie Thompson was extracting climate secrets from ancient glaciers. He finds the problem is even more profound than you might have thought

BY J. MADELEINE NASH
PHOTOGRAPHS BY THOMAS NASH

Even from the top of a 16,000-foot pass, Tibet's Naimona'nyi looks formidable, and the closer we get to it, the larger it looms, until, finally, its ice-glazed face disappears behind the steep, rock-strewn ridge we have yet to climb. At 25,242 feet, Naimona'nyi is the highest mountain in southwestern Tibet and the 34th highest in the world.

Below us runs a glacier-fed river turned milky by pulverized rock. The fall equinox has passed, and shrubs and grasses are turning crimson and gold. "Look at all the colors," Lonnie Thompson exclaims, delighted that winter is finally on the way. The onset of bitter cold might seem an odd thing to welcome, but, he says cheerfully, "for the ice it's good."

Thompson, one of the world's foremost glaciologists, is the leading authority on high-altitude glaciers of the tropics and near tropics, and he is as renowned in scientific circles for his physical courage as for the pathbreaking publications that stream from his lab. "An absolute hero," says Gavin Schmidt, a climate modeler at NASA Goddard.

This is Thompson's 51st major ice-coring expedition. All told, he has spent more than three and a half years at elevations above 18,000 feet. He has endured frostbite and altitude sickness. He rode a Mongolian pony for three days through driving snow and rain on a 1986 expedition to

Skeptics said it couldn't be done, but Lonnie Thompson (about to ascend the Naimona'nyi glacier in Tibet) has shown that glaciers yield clues to the rise and fall of civilizations thousands of years ago—and possibly in the near future.

the last 50 years have been."

Well before the end of this century, much of the ice that

China's Qilian Shan mountains. During a 1993 expedition to Huascarán, the highest mountain in Peru, he crawled across a yawning crevasse on a rickety wooden ladder; camped at 19,800 feet, he was trapped inside a tent as hurricane-force winds carried it toward a precipice. He averted a fall only by stabbing an ice ax through the tent floor.

Ice is like a time capsule that preserves the abrupt shifts in climate that have changed the course of human history. From the Quelccaya ice cap—a cap is larger than a glacier—in southern Peru, Thompson and his colleagues pieced together the droughts and floods that unhinged pre-Incan civilizations. In layers of ice cored from the Dasuopu glacier high in the Himalayas, they identified the dusty fingerprints of monsoon failures that have punished the Indian subcontinent with recurrent famine since A.D. 1440. Now Thompson, who is based at Ohio State University, is using high-altitude ice samples to come to grips with global warming.

"What really stands out," he says, "is how unusual the last 50 years have been compared to at least the last 2,000 and perhaps the last 5,000 years." Rising temperatures are rapidly reducing the ice that permanently caps high mountains around the world. Well before the end of this century, much, and in some areas most of it, will be gone. The loss is a harbinger of even larger, potentially catastrophic, consequences.

THOMPSON, I'm relieved to learn, does not intend to climb to the top of Naimona'nyi, which was not successfully summited until 1985. But the plan that he has devised with Yao Tandong, director of the Chinese Academy of Sciences' Institute for Tibetan Plateau Research and Thompson's longtime collaborator, is in some ways even more daunting. From our present elevation, about 16,000 feet, they aim to hike another 4,000 feet to the head of a massive ice field in the shadow of Naimona'nyi's highest peak. They will remain there for as long as it takes to drill down to bedrock and extract two or three continuous cores of ice, each hundreds of feet long.

We wait days for Yao's team to assemble a sufficient number of yaks. We breakfast, Chinese-style, on steamed bread and pickled vegetables and sort through gear to pass the time. Thompson is clearly eager to get under way. Finally, a jangle of bells announces the arrival of a small herd of yaks, bringing the number of pack animals to about 18. The yak herders load our stuff onto the backs of these curious bovines, excellent climbers with horns like buffaloes and tails like horses.

Then Thompson and his five-member team are off, with Vladimir Mikhalenko, an ice driller from the Russian Academy of Sciences' Institute of Geography, leading the way.

J. MADELEINE NASH *is the author of* El Niño: Unlocking the Secrets of the Master Weather-Maker. **THOMAS NASH** *is a physicist and photographer. They live in San Francisco.*

Following close behind are chief driller Victor Zagorodnov, glaciologist Mary Davis, graduate student Natalie Kehrwald and geochemist Ping-Nan Lin, all from Ohio State University (OSU). Thompson waves cheerily. "It'll be a walk in the park," he promises.

Half an hour later, I head out with my husband, Thomas Nash, a physicist and photographer; we trail a second group of hikers led by Yao, which will meet up with Thompson's group later in the day. The sharp incline is unrelenting, and I find that I am soon reduced to a rhythm of ten steps followed by a pause in which I suck in an equal number of breaths. In this tortured fashion, I eventually reach 18,400 feet, at which point the scenery explodes.

caps high mountains, in some areas most of it, will be gone.

Scouting the area near Naimona'nyi (the peak above), Thompson and co-workers identified nearly 60 glaciers, many of them pitted by water-filled holes, a sure sign of melting.

Far below I can see Lake Manasarovar, described by Swedish explorer Sven Hedin a century ago as "an enormous turquoise embedded between two of the finest and most famous mountain giants of the world," Kailash and Naimona'nyi. This stunning tableau, about 10 miles from Nepal and 20 miles from India, is among the world's most sacred landscapes. According to Hindu and Buddhist belief, this is the center of the universe, and four great rivers are said to flow through subterranean passages. This is figuratively true: four of Asia's most important waterways—the Indus, the Sutlej, the Brahmaputra and the Ganges—are fed by the snow and ice fields of this mountainous region.

As we set up our tent for the night, I feel pressed in upon by walls of gray, unstable rubble, the legacy of some long-ago era when the ice here was advancing rather than retreating. We awake to see the sun starting its slow pan across our deep, dark valley. It will be at least another hour before the glacier-fed stream below throws off its frozen quilting. Pulling on layers of fleece, Thomas and I join the others for breakfast. Between sips of steaming tea, I study Thompson.

Now 58, he seems little changed from the man I first met a decade ago, though his brown hair has grayed and his asthma, which was diagnosed some 15 years ago, sounds a little

In 1974, Thompson found himself staring up at a dazzl

worse. Of medium height and build, he's not physically imposing. But he possesses nearly superhuman determination and drive. The second child of three, Thompson spent his formative years on a small farm in Gassaway, West Virginia. Neither of his parents went beyond the eighth grade, though his mother later earned her high-school equivalency. The family struggled financially, even before Thompson's father, an electrician, died when Lonnie was in high school. At one point the young man held four jobs to bring in needed income. In 1966 he won a scholarship to West Virginia's Marshall University, where he majored in geology. There he met Ellen Mosely, a petite physics major who went on to get a PhD in geography; she is Thompson's scientific partner, and they've been married for nearly four decades.

Though it has taken many years, honors and prizes are flowing Thompson's way. This summer, he will be awarded the National Medal of Science by President Bush. But Thompson's lifestyle remains simple. He and Mosely-Thompson still live in the unpretentious white-frame house they bought a quarter century ago in Columbus, Ohio; their daughter, Regina, an FBI agent, and her husband live nearby. For exercise, the Thompsons walk their small dogs, Russ and Kino, in a little park down the street.

Initially, Thompson says, he wanted to become a coal geologist, combining his interest in earth sciences with a desire to make a good living. Glaciology did not attract him at all. "I can remember studying glaciers [at Marshall] and thinking to myself, what a waste! Glaciers take up only a very small percentage of the surface of the earth; they're in really remote areas where people could not care less about what happens, so why in the world would anyone take the time to study them?" After a brief stint in the National Guard, Thompson enrolled in 1972 as a graduate student at OSU and, to defray expenses, hired on as a research assistant at the university's Institute of Polar Studies. He soon found himself staring at the first deep ice core ever retrieved from Antarctica. It was a revelation.

For those who can decipher its arcane script, ice has fascinating stories to tell. Fluctuations in various isotopes, or atomic forms, of oxygen document swings between warm and cold epochs; fluctuations in nitrate levels mark how plants respond to the expansion and contraction of ice. Ice contains bubbles of air from ancient atmospheres and layers of ash from long-ago volcanic eruptions. It contains layers of windblown dust that yield information about broad shifts of precipitation, rising during dry epochs and falling during wet. And ice records shifts of precipitation in the form of thicker and thinner annual layers.

For a long time, glaciologists gave little thought to the high-elevation ice of the lower latitudes. (At about 30 degrees of latitude, Naimona'nyi falls within the near tropics.) The scientific action, it was all but universally assumed, lay in the dramatic expansions and contractions of the great ice sheets in Antarctica and Greenland. Besides, most scientists assumed that ice anywhere close to the Equator would have melted and refrozen many times, erasing any history written in its layers.

Two years before getting his PhD, Thompson accompanied Ohio State geologist John Mercer on an exploratory expedition to Peru's Quelccaya ice cap. Mercer had the idea that it might tell him whether major advances of ice in the Northern and Southern hemispheres occurred at the same time. It was a problem that also interested Thompson, who was then comparing dust layers in ice from Antarctica and Greenland.

Which is why, in the summer of 1974, Thompson had his first encounter with the dazzling expanse of white that would change his life forever. Some 18,700 feet high, the huge Quelccaya ice cap extended over 22 square miles. But what enthralled him was its dramatic western face. It looked remarkably like a 180-foot-high wedding cake, with layers of pellucid ice alternating with layers darkened by dust. Had Quelccaya ever melted, Thompson realized, those sharply delineated layers would have collapsed into homogenized slush.

It was the start of an epic struggle to study the ice cap, one that many predicted Thompson would lose. "Quelccaya is too high for humans, and the technology [to drill it] does not exist," Denmark's Willi Dansgaard, one of the titans of glaciology, famously observed. Indeed, Thompson's first big expedition to Quelccaya, in 1979, ended ignominiously when the Peruvian pilot commissioned to airlift the heavy drilling equipment grew nervous about high winds and backed off. Before Thompson returned to the ice cap, he applied to Ohio State's MBA program. If he came back empty-handed again, he had decided, he would quit glaciology and apply his talents elsewhere. "And probably," he says today, "I would have made a lot more money."

But Thompson and colleagues returned from Quelccaya triumphant, in possession of a 1,500-year-long climate record. Clearly preserved in the ice were dramatic swings from wet to dry that coincided with variations in sea-surface temperatures characteristic of the El Niño climate cycle. Preserved, too, were longer-term swings, from rainy spells to droughts lasting decades and even centuries, and in which archaeologists found eerie parallels to the rise and fall of the great pre-Incan civilization of Tiwanaku that flourished along the shores of Lake Titicaca more than a thousand years ago. Thompson then knew that his ice cores could capture climate—and human—history.

WITH AN AVERAGE elevation of around 15,000 feet, the Tibetan Plateau, which Naimona'nyi helps define, is the world's highest and largest plateau, encompassing an area one-third the size of the continental United States. Colossal mountains, including 29,035-foot Chomolungma,

ing expanse of white that would change his life forever.

Peru's Quelccaya ice cap, each visible layer reflecting a year's precipitation, convinced Thompson that glaciers were worth studying—and just in time. This 180-foot-high ice cliff, photographed in 1977, had disappeared by 2002.

which is what the Tibetans call Mount Everest, stand guard over the plateau. This area holds the largest amount of ice in the world outside the polar regions, one reason it is often referred to as the Third Pole.

In geologic terms, the Tibetan Plateau is fairly recent. The uplift that created it began about 55 million years ago, when the Indian subcontinent crashed into Eurasia. The battle between these two giant slabs of earth's crust continues to this day, pushing the Himalayas skyward by nearly a half inch per year. As the plateau was slowly uplifted, it reached into progressively thinner layers of the atmosphere, each one less capable of screening out ultraviolet radiation in summer and trapping infrared heat in winter.

At some point, probably between 15 million and 22 million years ago, the temperature swing from summer to winter became so extreme that it powered the Asian monsoon, a giant oscillating breeze that drives the yearly rain cycle across a vast swath of Asia, the most populous region on earth. In summer, the Tibetan Plateau heats up, and like a huge hot-air balloon, air across the plateau rises, creating a zone of low pressure that sucks in moist air from the Bay of Bengal and the South China and Arabian seas, bringing rain to much of Asia. In winter, cold air descends from the Tibetan Plateau and pushes dry continental air seaward.

The Asian monsoon created the modern-day river basins whose fertile flood plains sustain about half the world's population. Many scientists believe the monsoon also helped cool the planet. Ever so slowly, the rains removed carbon dioxide, the heat-trapping gas most responsible for global warming, from the atmosphere. When the gas is dissolved in rainwater, it turns into an acid, which then reacts with rock to form more stable carbon compounds. In this fashion, says Boston University paleoclimatologist Maureen Raymo, the Asian monsoon set the stage for the succession of ice ages that started about three million years ago.

Now it is becoming clear that such natural mechanisms for sequestering atmospheric carbon dioxide are being overwhelmed by the burning of fossil fuels—coal, oil and natural gas. There is more carbon dioxide in the atmosphere today than at any time during at least the past 650,000 years, based on analyses of the chemical composition of air bubbles entrapped in Antarctic ice over that time. By the end of this century, carbon dioxide levels could easily double, and many scientists expect global warming to disrupt regional weather patterns—including the Asian monsoon.

There is no question that big changes are already afoot in the Tibetan Plateau. In 2004, Chinese glaciologists published a survey of their country's 46,298 ice fields, the majority of which lie in Tibet. Compared with the 1960s, the area covered by glaciers shrank by more than 5 percent, and their volume by more than 7 percent, or more than 90 cubic miles. That much ice holds enough water to nearly fill Lake Erie. Moreover, the rate of ice loss is speeding up. At present, Yao tells me, the glaciers near Naimona'nyi are drawing

LONNIE THOMPSON

It's the clearest sign yet that rising concentrations of

back by eight million square feet per year, five times their rate of retraction in the 1970s.

The loss of high-mountain ice in the Himalayas could have terrible consequences for people living downstream. Glaciers function as natural water towers. It's the ice melt in spring and fall that sends water coursing down streams and rivers before the summer monsoon arrives and after it leaves. At present, too much ice is melting too fast, raising the risk of catastrophic flooding; the long-term concern is that soon there will be too little ice during those times when the monsoon fails, leading to drought and famine.

Worldwide, a massive loss of ice, a long-predicted consequence of global warming, is now in progress, from Alaska to Patagonia, from the Rockies to the Alps. Even more disturbing, the great ice sheets that cover West Antarctica and Greenland are showing signs of instability. The mile-deep Greenland ice sheet, Thompson notes, contains enough water to raise sea level by something like 20 feet, and while neither he nor anyone else expects all that ice to disappear suddenly, it's clear that its accelerating loss will contribute to rising oceans.

Speaking out in the early 1990s, Thompson was one of the first scientists to call the public's attention to glaciers and ice fields as barometers of climate change. He has continued to do so in the years since, reinforcing his message with hard data and before-and-after photographs of disappearing ice fields. Today he has a lot of company. As temperatures push ever higher over the next century, the latest United Nations report warns, the loss of ice can be expected to continue, reconfiguring coastlines and ecosystems on a global scale.

THOMPSON IS STARTING the arduous climb to the drilling camp, located high on an ice-filled corridor between two glaciers. He moves steadily but slowly, drawing his breath in ragged gasps. Every now and then he pauses to bend at the waist, as if taking a bow. It's a trick, he says, for easing the burden that high altitude places on the heart.

He stops at the top of a tower of rocks deposited by a past advance of ice. Directly below is the glacier he plans to climb. "It'll be a walk in the park," Thompson says, panting. Shortly, he moves off, clambering across the ice-mauled debris that limns the glacier's course. "That's what you said last time," I yell after him.

My husband and I decide to head back to Lhasa.

Thompson's team would spend two weeks on the glacier and pull out three cores, one more than 500 feet long (contained in about 140 tubes), representing thousands of years of the glacier's and the atmosphere's history. Then, because their permits had expired, they returned to Lhasa, entrusting their Chinese colleagues with getting the ice off the glacier. It was not an easy task. The first truck hired to haul the cores the 900 miles back to Lhasa never showed up. Porters and yak herders threatened to quit. A two-day snowstorm struck. A second truck choked on the thin air; to keep it running, its drivers had to inject oxygen into the engine from a bottle fetched from Lhasa.

ABOUT two months after leaving Tibet, I step into the cavernous freezer at OSU's Byrd Polar Research Center. The temperature stands at minus 30 degrees Fahrenheit. Here, stashed on steel shelves, are thousands of shiny aluminum tubes that hold Thompson's collection of ice cores. Organized by expedition, the tubes measure a meter in length; their caps bear an identifying set of letters and numbers.

My companion, graduate student Natalie Kehrwald, is making a first pass through the Naimona'nyi cores, and even though she's dressed in a wool hat and down jacket, she doesn't linger long in the freezer. Pulling out the tube she wants, she dashes from the freezer to a small anteroom that, mercifully, is some 50 degrees warmer. There she pulls out a cylinder of ice and places it on a light table. This section of the core contains subtly alternating bands of clear and cloudy ice. The transparent bands mark intervals of high precipitation, while the more opaque bands signify drier, dustier times. The pattern is strangely beautiful.

Kehrwald examines other lengths of ice. One, from a depth of about 365 feet, is filled with fine air bubbles, which often form under extremely cold conditions. Another, from an even greater depth, contains ice so clear it looks like glass. But it's the ice from closer to the surface that causes the most excitement, for some of it contains intriguing dark flecks that may be fragments of insects or plants—remains that can provide solid rungs in the ladder of time.

Thompson's Andean ice, for example, contains ash from known volcanic eruptions, like Huaynaputina's in southern Peru in A.D. 1600. It also incorporates organic detritus that can be radioactively dated. In 1998, Thompson found the remnants of a 6,000-year-old insect in the ice he wrested from a dormant Bolivian volcano. In 2004 and 2005, he recovered 5,200-year-old marshland plants from the Quelccaya ice cap's shrinking edges. Insects and plants near the top of an ice cap or glacier are not so important, since the upper layers bear stripes that reveal the years like tree rings. But establishing dates becomes critical deep in the core, where the weight of overlying ice squeezes annual layers of snow so close together they seem to merge. Just a smattering of independently derived dates from organic material would help nail the Tibetan timelines to the wall.

As Thompson looks at his cores across a long fetch of space and time, he sees what appears to be a wavelike sweep of ice growth proceeding south to north across the Equator. This pattern, Thompson says, bears a striking correspon-

greenhouse gases are profoundly damaging the system.

Camping at 20,000 feet on the Naimona'nyi glacier for 12 days (above right), Thompson and colleagues managed to drill three ice cores, one more than 500 feet long (left, workers at a drilling tower). Each core, spanning some thousands of years of glacier history, was then sliced into meter-long sections, which the scientists and porters then carried (top right) miles down the mountain.

NATALIE KEHRWALD; LIDE TIAN; LONNIE THOMPSON

dence to a 21,500-year astronomical cycle. Known as the precessional cycle, it derives from the fact that the earth, like a child's top, wobbles as it spins, altering the time of year in which the Northern and Southern hemispheres come closest to the sun. That, in turn, affects precipitation patterns, including the strength of monsoons.

The precessional pattern is still at work, says Thompson, but its influence is becoming harder to detect. "To me this is what makes our world today seem so different from the past," he muses. "If nature alone were in charge, then glaciers should be growing in the lower latitudes of one hemisphere and retreating in the lower latitudes of another. But that's not what's happening." As he sees it, the fact that glaciers and ice fields are dwindling virtually everywhere constitutes the clearest sign yet that rising concentrations of greenhouse gases are profoundly damaging the natural system.

A couple of months before heading off for Naimona'nyi, Thompson says, he revisited Peru's Quelccaya, where the ice is now receding at an alarming rate. Qori Kalis, the out-

"Once you lose the ice, you lose the history."

Thompson (with a Peruvian ice core in his Ohio State freezer) predicts that many high-altitude ice fields will melt into oblivion, the only remaining traces of them stored in labs.

let glacier he's regularly measured for the past 28 years, has thinned so much that he expects it will have vanished by the time he returns this year. As for Mount Kilimanjaro, the highest peak in Africa, he says, "its ice fields are now just spikes. And once you lose the ice, you lose the history, you lose the record." Fortunately, Thompson got to that iconic mountain just in time; seven years ago he mounted an expedition that pulled out an 11,700-year record of the climate swings in East Africa, including a drought 4,000 years ago that coincided with the collapse of Egypt's fabled Old Kingdom. He keeps a list in his head of 13 more high-elevation ice fields that he'd like to drill before it's too late, including the rapidly shrinking Carstensz glacier on 16,023-foot Mount Jaya, New Guinea's highest peak. He admits he probably can't get to them all.

Perhaps not surprisingly for a native West Virginian who once considered a career in coal geology, Thompson often draws an analogy between glaciers and the proverbial canary in the coal mine. Like the bird, glaciers are warning us of the buildup of dangerous gases. But there is one important difference. "In the past, when the canaries stopped singing and died, the miners knew to get out of the mine. Our problem is, we live in the mine."

Visit Smithsonian.com for an interview with Madeleine and Thomas Nash.

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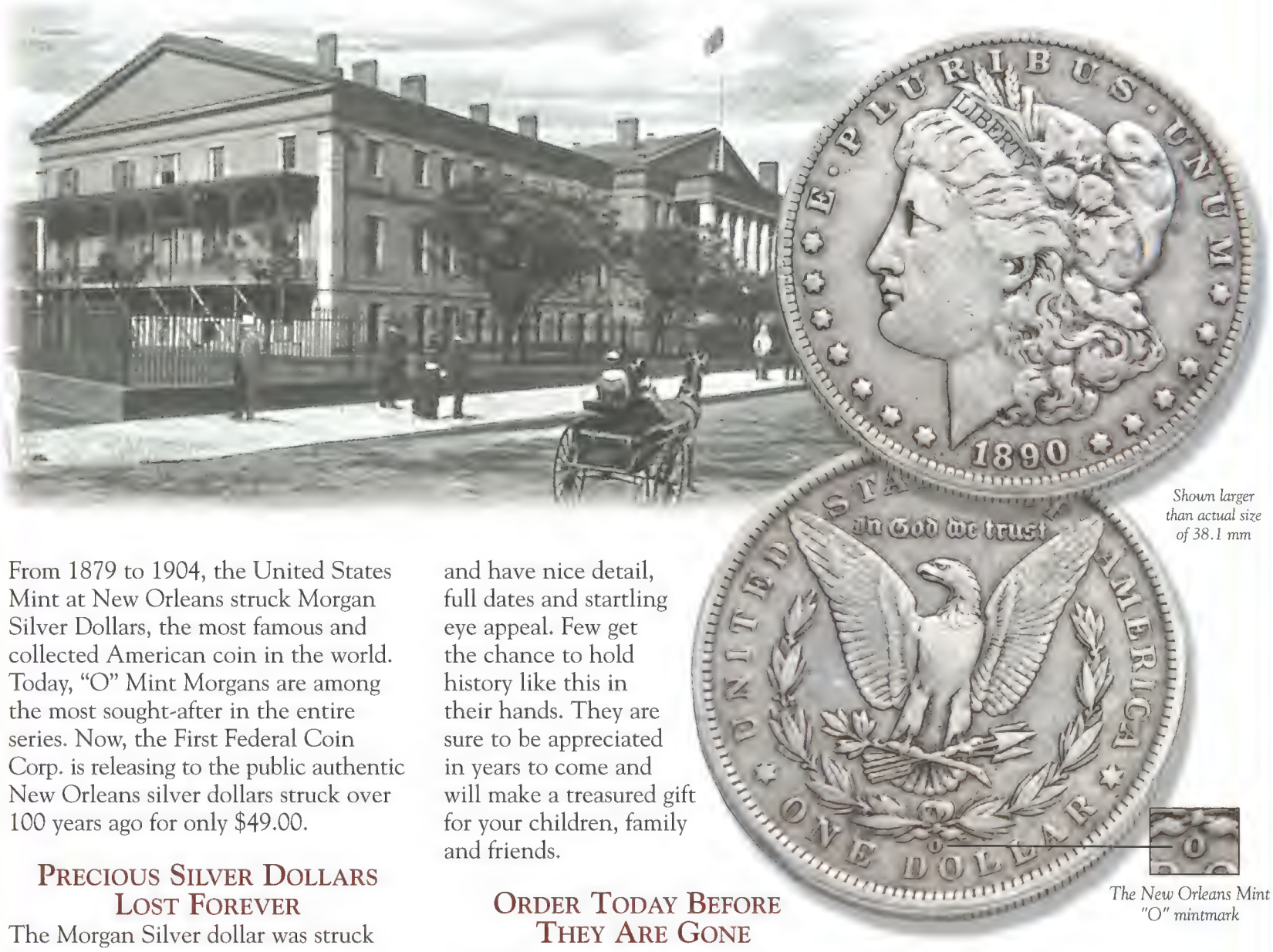

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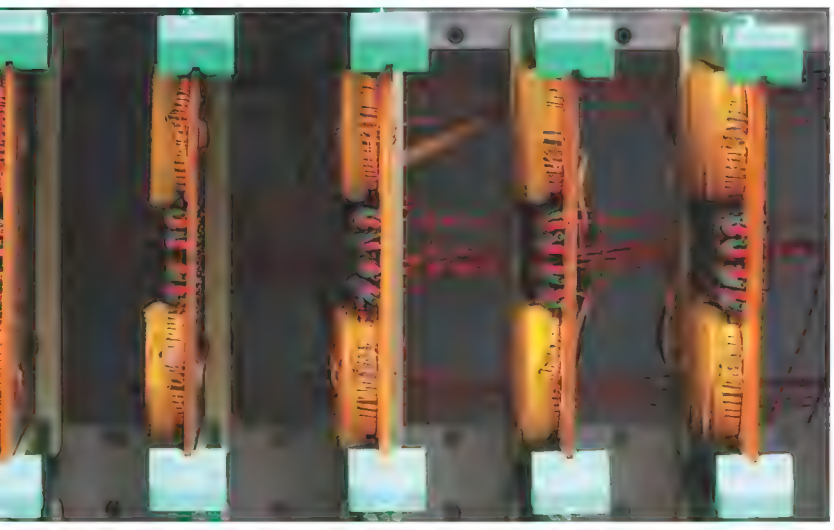
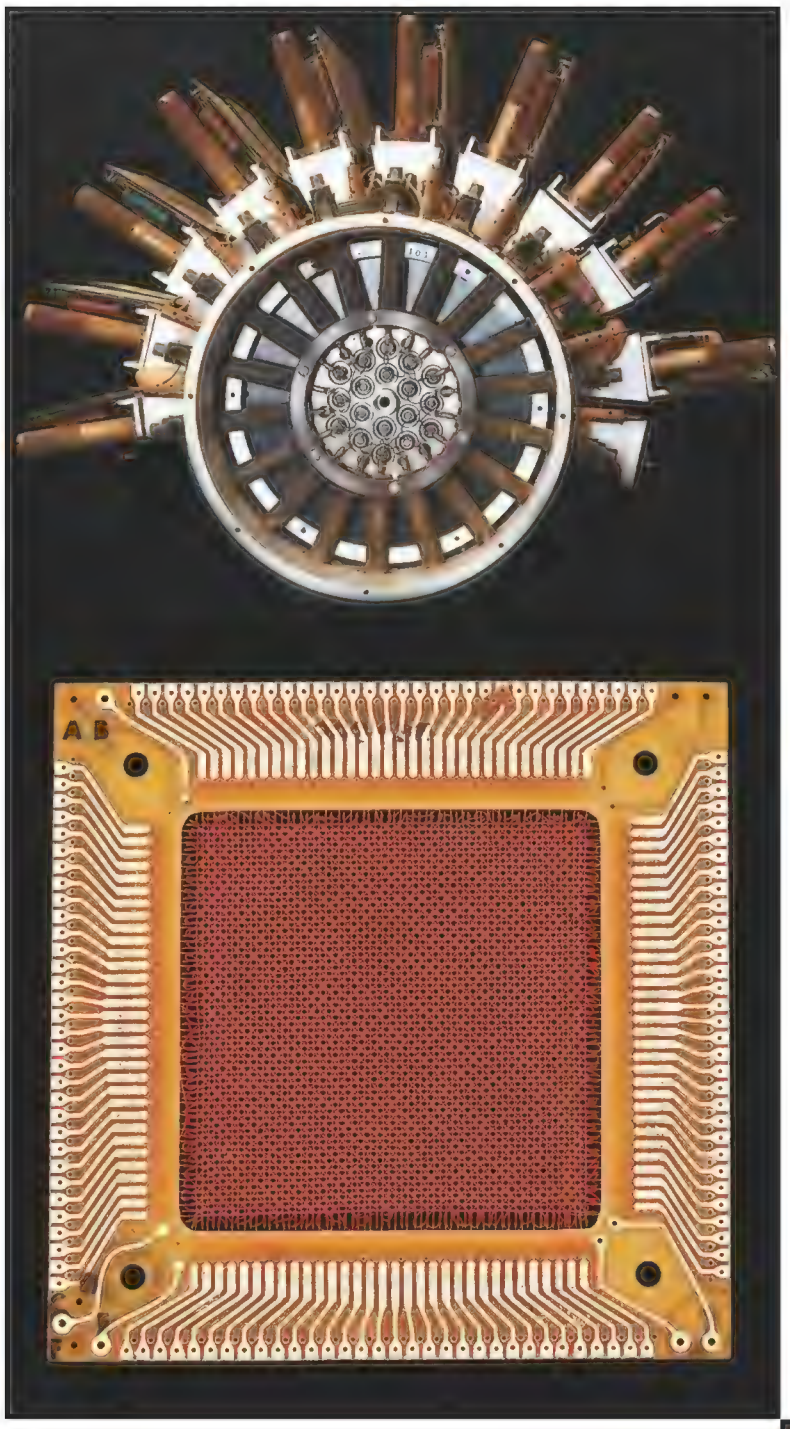
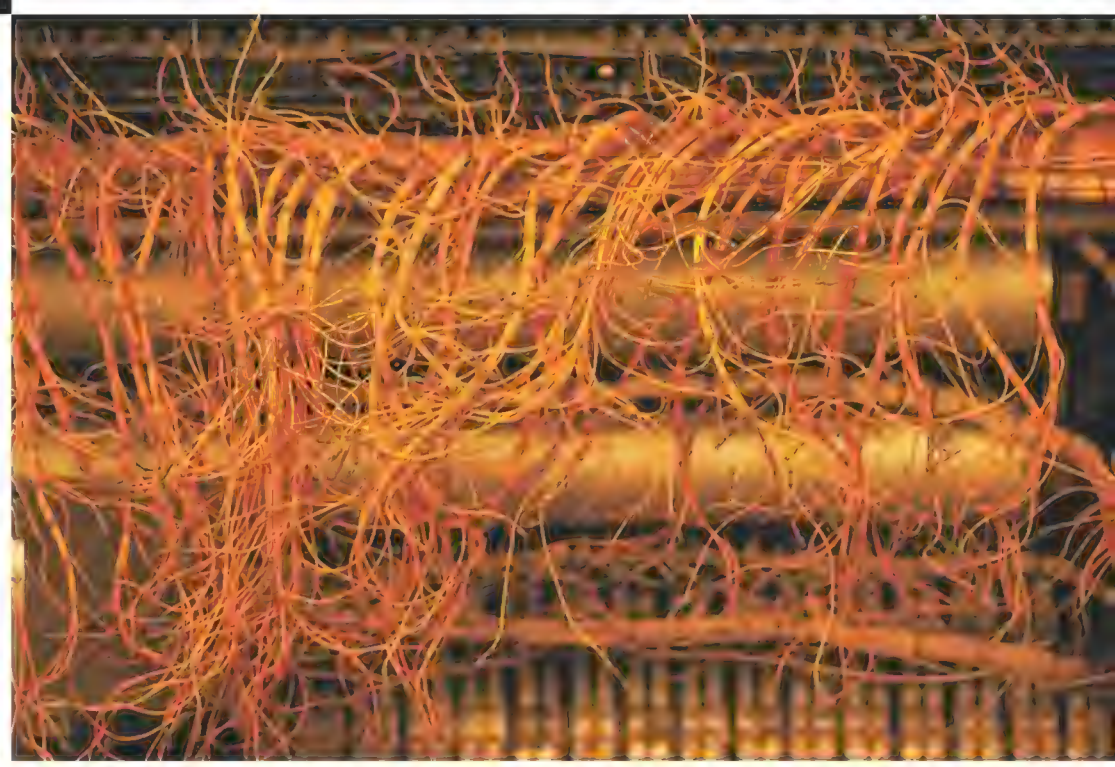


A photojournalist enchanted by computers takes another look at the soul of some old machines

BY KATY JUNE-FRIESEN PHOTOGRAPHS BY MARK RICHARDS



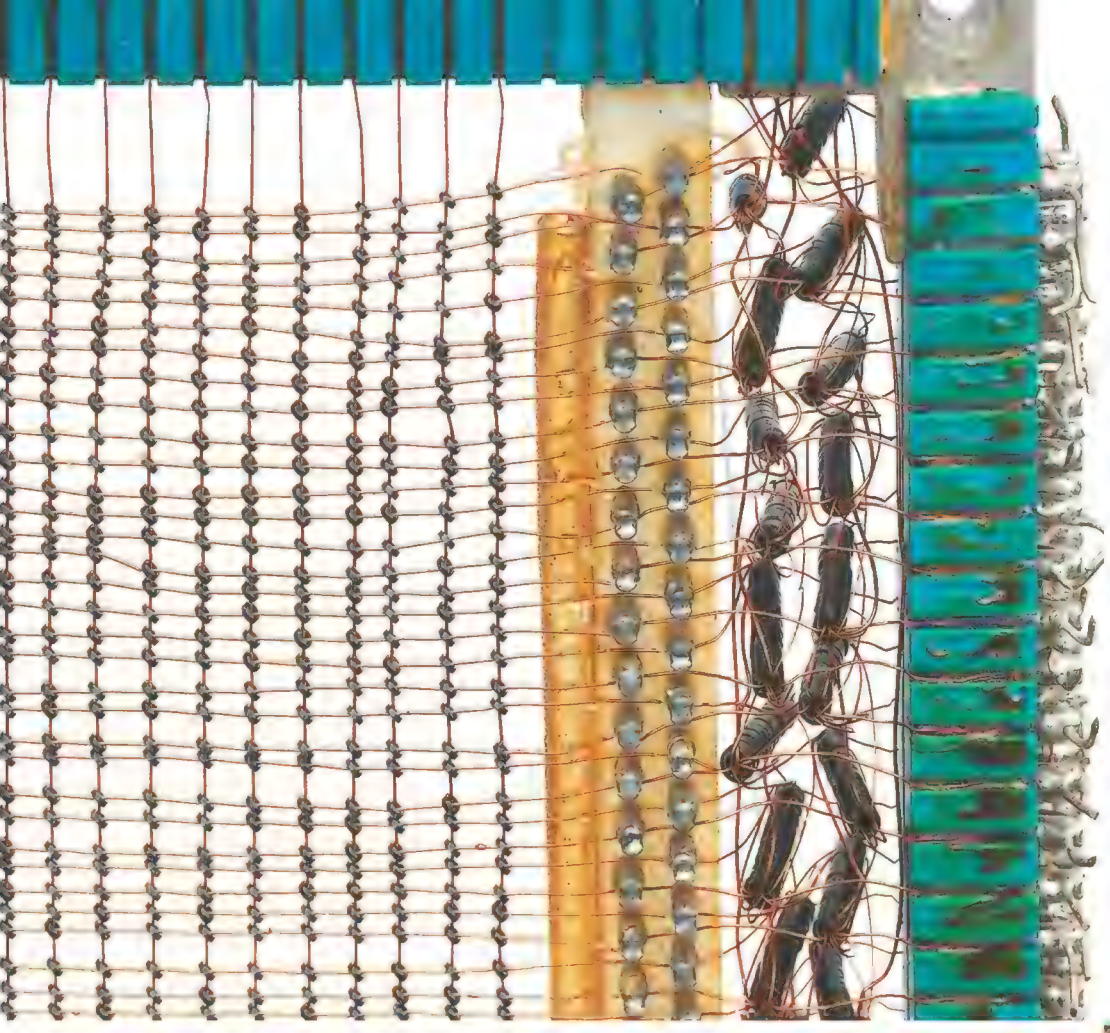


We always knew there was a lot of artistry in computer science, but Mark Richards' photographs make the idea concrete. Taken at the Computer History Museum, in Mountain View, California, the surprisingly warm, even organic, pictures document the ingenuity of computing's pioneers. Opposite top: The German 1941 Z3 Adder (a reconstruction) used telephone relays instead of vacuum tubes as switches for memory. Opposite bottom: The U.S. Army-sponsored ENIAC—essentially a room-size calculator—cost about $500,000 in 1946 and had 18,000 tubes. Top: At the heart of the first commercial computer, the 1951 Univac 1, was this memory device, known as a mercury delay line. Above: A c. 1965 magnetic core plane stored information by magnetizing the small rings in the copper mesh. Right: A 1961 IBM mainframe's wires, reminiscent of root tendrils or blood vessels, almost evoke a living organism.

NOT LONG after photographer Mark Richards walked into the Computer History Museum, in Mountain View, California, he was smitten with the vintage adding machines, supercomputers and PCs. In this high-technology museum—home to Google's first production server and a 1951 Univac 1, America's first commercial computer—Richards saw more than engineering brilliance. He saw beauty.

Richards' resulting still lifes have just been published in *Core Memory: A Visual Survey of Vintage Computers*, 150 strikingly warm pictures of machines, parts and paraphernalia. Richards, a 51-year-old photojournalist who has worked for *Time*, *Newsweek* and the *Los Angeles Times*, spent three months shooting at the Silicon Valley museum. "I've lived with these machines for so long," he says, "they're like relatives that you love-hate."

Such familiarity has not traditionally characterized art photographs of machines and industry. In the 1920s and '30s, Margaret Bourke-White's stark photographs of a looming dam and towering smokestacks, or Charles Sheeler's clinical photographs of a vast Ford Motor plant, established a certain distance between viewers and technology. But in Richards' images we are at times almost inside the machinery, and instead of being alienated we are drawn to the shapes and textures. The yellow wires of the IBM 7030 (below) look like a plant's hanging roots. Richards says a



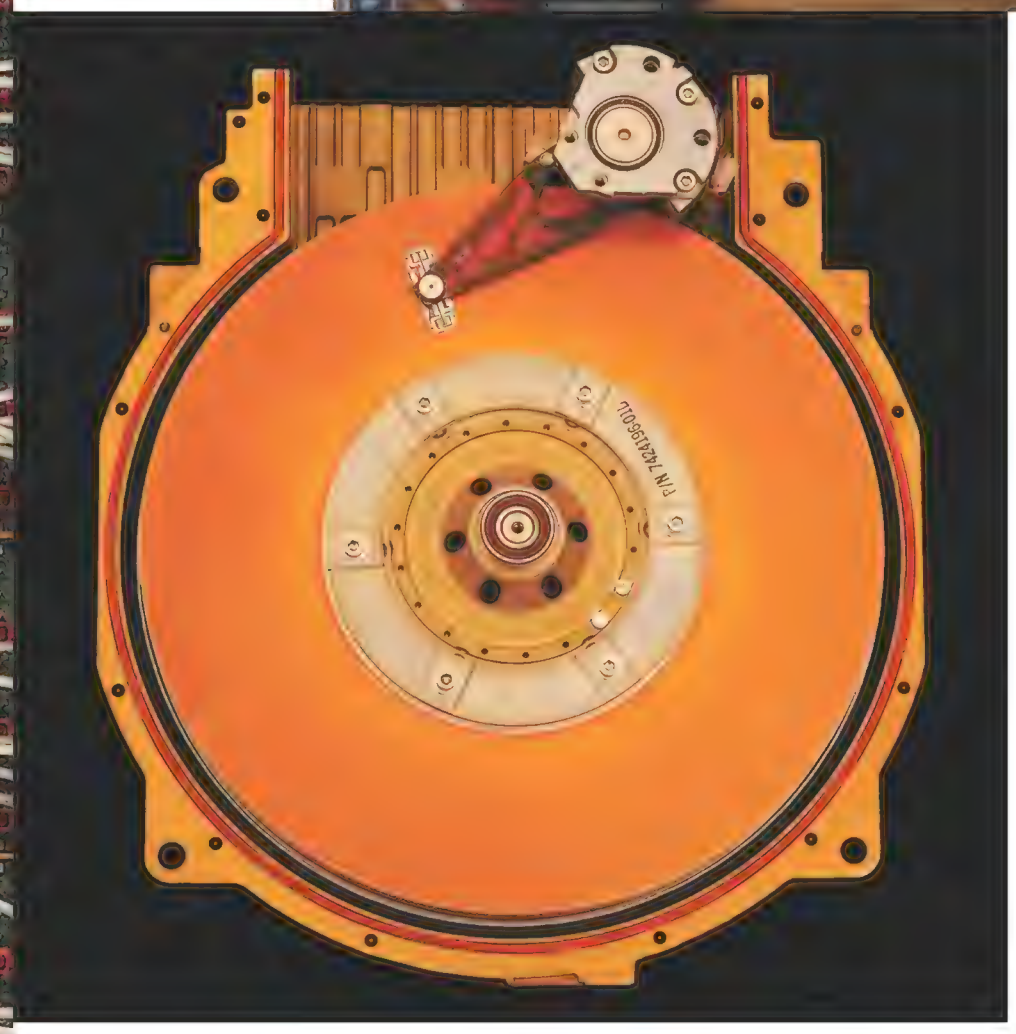
"It seems unlikely that we shall be able to digest fully the impact of the computer—barely 50 years old—for a long time to come," says Dag Spicer of the Computer History Museum. Yet these pictures offer glimpses of the machine's evolution. Left: Another version of a magnetic core plane, c. 1962. Below: To an anatomist, the bundled wires in a console backplane of a 1968 IBM mainframe—the company's fastest commercially-available scientific computer at the time—might suggest a spinal cord.

1975 ILLIAC (Illinois Automatic Computer) IV has wiring—bundles of red and blue veins—that looks like anatomical illustrations from Leonardo's time. He was impressed by such "organic" forms, he says, but also by creature-like machines that seem straight out of science fiction.

Richards' photographs demystify technology to a certain extent—we see the hard drives, tape reels, memory boards, bulbs and vacuum tubes—but they also rely on an element of mystery, exalting form over utility. The spiky screw-studded mercury delay line of the Univac 1 (p. 77) could just as easily be a helmet for a cyber charioteer as a memory tank for a computer used to process census data. Richards zooms in on the circa 1965 magnetic core plane: a gold frame woven with a bright fabric of red wires, strung from rows of metallic pins. That the core "is a magnetic force that drives the ability of rings and wires to store information," as the accompanying text by John Alderman labors to explain, hardly adds to the photograph's power.

Richards, a self-proclaimed geek, admits that there are computer parts and hard drives lying around his house, in Marin County, California, where he sometimes actually builds computers. Indeed, he seems to revel in the technology of his photography project, particularly the fact that he used a computer to process his digital photographs of computers. Even so, his intimate portraits reveal the unmistakable mark of a human hand.

MARK RICHARDS *created the photographs for* Core Memory: A Visual Survey of Vintage Computers *(Chronicle Books).*
KATY JUNE-FRIESEN *is a writer in Washington, D.C.*



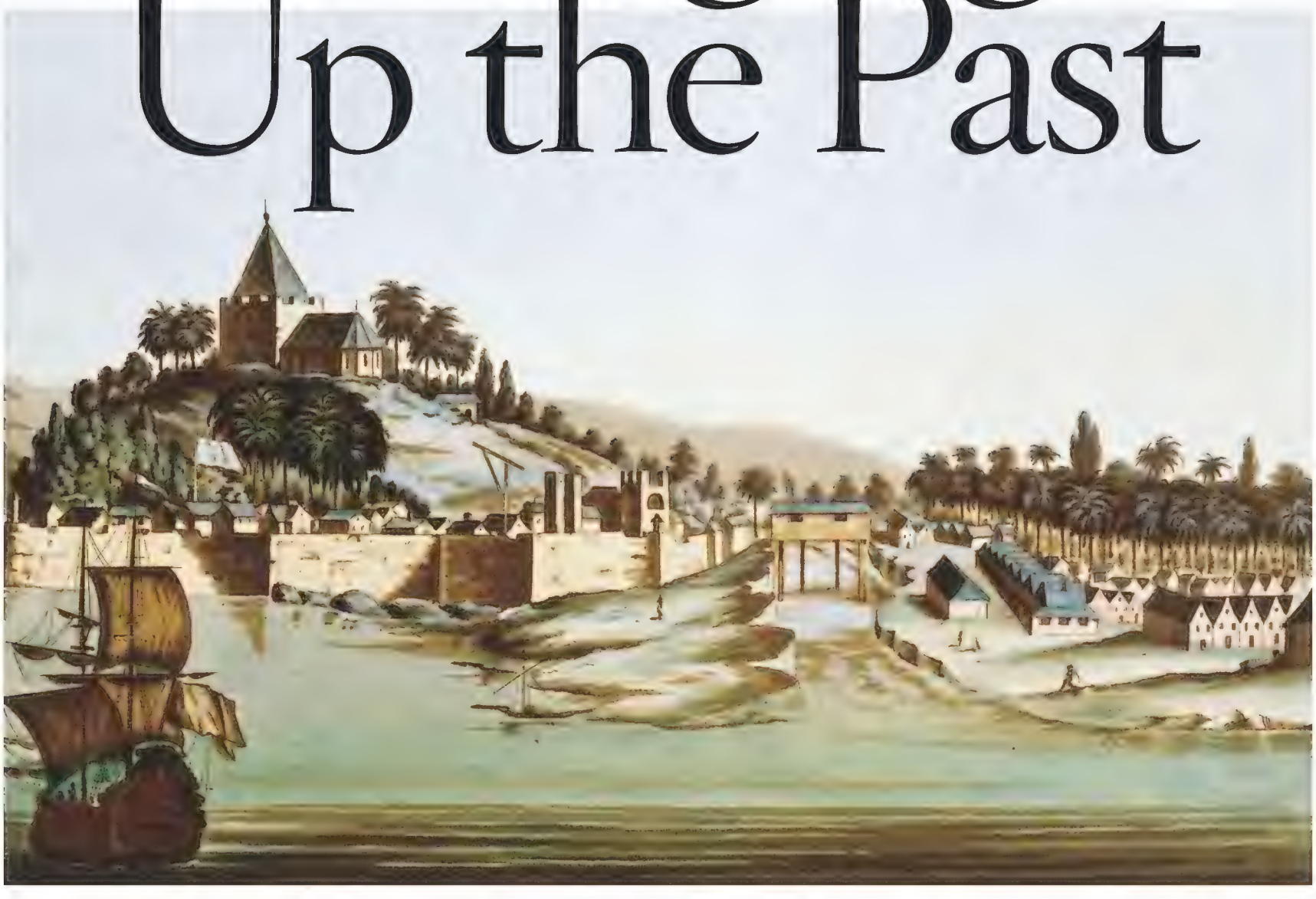
Plywood? In a computer? The company that crafts the chic iPod had to start somewhere. Above: One of the 220 Apple 1 desktop computers that founders Steve Wosniak and Steve Jobs sold in 1976. Left: A DEC hard disk drive c. 1980. The invention let users jump directly to data they wanted without scrolling through a tape; when later installed in PCs, the hard disk brought real computing power to the people.

For an interview with the Computer History Museum's curator, go to Smithsonian.com.

BY DAVID DEVOSS

Underwater excavations are yielding unimagined riches—historical and monetary—from the ancient trade between Arabs and Chinese

Bringing Up the Past



Ships bearing Arab and Chinese goods braved dangerous waters (above, the Malaysian city of Malacca, in an early 19th-century rendering). Recent treasures from wrecks include a 9th-century Chinese dish (top) and 15th-century Chinese porcelain (opposite).

STAPLETON COLLECTION / CORBIS; P. 81 FREDERIC OSADA / FRANCK GODDIO / HILTI FOUNDATION

At dawn, the aging trawler puttered downriver past Malacca's moldering warehouses, relics left by long-forgotten European merchants who made their fortunes in colonial Malaya. Atop a hill to the left soared the ruins of St. Paul's Church, where St. Francis Xavier is said to have denounced dissolute parishioners in the 16th century for turning Portugal's most important colony into "the Babylon of the East." At the hill's bottom was evidence of the Portuguese population's comeuppance—the 18th-century Christ Church, whose floor the Dutch paved with the tombstones of their rivals. The most evocative symbol of the city's storied past could be found at the river's mouth: a replica of the *Flor do Mar*, the Portuguese carrack that set sail for Goa with tons of gold and jewels looted from the Malacca sultanate—only to founder off Sumatra in 1511.

Entering the Strait of Malacca, the trawler's barefoot captain set a course parallel to the coast; marine archaeologist Michael Flecker and two officials from Malaysia's Department of Museums unspooled a side-scan sonar designed to record a portrait of the ocean floor. A few months before, aided by a magnetometer, a GPS and an electronic device for finding fish, Flecker had located a wreck that probably went down in a late 16th-century battle for control of the spice trade. Now he hoped to discover a lost cargo of Chinese porcelain from an Asian trading vessel of the sort that plied Southeast Asian waters before European powers arrived.

"Ceramics were a major commodity long before the arrival of the Portuguese in 1511," the archaeologist said. An Australian who heads a marine archaeology consulting firm called Maritime Explorations, Flecker was studying the sonar readout, looking past smudgelike schools of fish for seabed anomalies that might indicate a shipwreck buried under centuries' worth of sediment. "A well-preserved ceramic cargo carefully excavated by trained archaeologists can be just as valuable as gold or silver," he added.

"There's no more exciting place to work," says Australian marine archaeologist Michael Flecker (above, in Malacca Harbor). Chinese porcelain (right) that he recovered off the island of Celebes, east of Borneo, dates to the 18th century.

KRIS LEBOUTILLIER / GETTY IMAGES (2)

In 1999, Flecker helped excavate one of the oldest wrecks yet found in Asian waters, now called the Tang wreck. Its horde of 9th-century artifacts included (top, from left) a gold cup, gold dish and earthenware cup; (middle, left and right) a ewer and bowl from China's famed Changsha kilns and (center) a bowl with a dragon medallion; and (above) a shallow gold drinking cup.

SENTOSA LEISURE GROUP (7)

We trawled at three knots well into the afternoon as a parade of supertankers and freighters stacked high with containers glided silently across the horizon. When a distinct shape resembling a twisted pipe appeared on the sonar, the Malaysian officials scrambled for their cellphones. "Wait a minute, fellows," Flecker said. "That's the *Stratagem*"—a British sub sunk during World War II.

The sun was heading toward Sumatra's mangrove swamps when Flecker sat upright, scribbled GPS coordinates on the sonar's paper readout and ordered the boat to come about. "This could be something," he said, pointing to an image on the sonar. "It's 75 feet long—the right size for a ship—and there's scour caused by the bottom current."

But was it a shipwreck or a fishing net snagged on a reef? Diving was the only way to tell. "I've spent nearly 20 years salvaging ten ships, and there's no more exciting place to work," Flecker said. "Islam came to Asia in the seventh century on ships that sailed along this coast. China's treasure fleets stopped here on their way to India and the Arabian Peninsula. You can dive about anywhere off Malacca and find ceramic shards in the mud." But not now: Indonesian pirates like to work at dusk.

Returning to the spot the next morning, Flecker donned scuba gear, entered the water and followed the anchor rope down into the murk and to an ancient wooden hull. Stone cannonballs resting near the stern and a bronze cannon nearby suggested that it was a 16th-century Portuguese carrack. But Flecker's hopes faded as he fanned through the sediment and found only ballast stones.

Between 1606 and 1641, Portugal and Holland fought to control the Strait of Malacca in a rivalry so intense that Portuguese captains burned their ships to keep them from falling into Dutch hands. As Flecker probed the bulkhead with a knife, he found a layer of char, indicating that this ship was burned before it was scuttled. Whether the cargo had been taken as a prize or dumped overboard to prevent capture, he would never know.

Sailing east from the Indian Ocean to the South China Sea, ships had to negotiate the straits and shoals of Southeast Asia, all the while trying to avoid the Acehnese pirates of northern Sumatra. But the rewards were seen as justifying the risks.

ASIA'S TRADE WITH THE OUTSIDE WORLD may have originated on the Silk Road, but by the eighth century A.D. more and more of it was traveling by sea; bringing up shipwrecks from that trade has only recently begun to illuminate the region's history. (Last month China's National Museum was to begin operations 20 miles off the coast of Guangdong Province to raise intact an 800-year-old vessel believed to contain 70,000 porcelain objects.) Boats laden with ivory, myrrh and metal from the Abbassid caliphate in Baghdad took on Persian pearls, alum and cumin along the Strait of Hormuz before sailing out of the Persian Gulf, down India's Malabar Coast and across the Indian Ocean to the Buddhist kingdom of Srivijaya, on Sumatra's eastern shore. Srivijaya's port of Palembang was the most bustling of its day, a center for merchants dealing pepper from Borneo; cloves, nutmeg and mace from the Molucca Islands; and, eventually, sandalwood from Timor.

Many of these goods were bound for China. Riding the southwest monsoon, ships headed for ports along the China coast sailed north from the Malacca, Sunda and other straits in early summer, stopping along the way for tortoiseshell and kingfisher feathers. Returning ships left China in winter, when the winds of the northeast monsoon began to blow.

The ocean-borne trade was tremendously profitable—and commensurately risky. Acehnese pirates from northern Sumatra were a constant threat (even today, more than a third of the world's recorded pirate attacks occur in the Strait of Malacca). Mariners could avoid Aceh and other pirate coves by sailing southeast to the Sunda Strait, between Sumatra and Java, but between there and the South China Sea lie some of the most dangerous reefs in the world.

China's emperors rapidly became enamored of objects from the *Nanhai*, their term for the oceans to the south. But Confucian orthodoxy tended to view commerce as a lowly undertaking; at times the mandarins running the court were hostile to arriving merchants, and occasionally private citizens were forbidden from going overseas and engaging foreigners in trade. China generally resolved its conflict by defining some imported items as "tribute" and those selling the goods as emissaries from vassal states. In 714, China made the charade official by establishing its first Superintendent of Barbarian Shipping.

Tribute trade boomed. Monks unfamiliar with aromatic

DAVID DEVOSS, *an editor for East-West News Service, spent nine years as* Time *magazine's Southeast Asia correspondent.*

MIKE REAGAN

resins soon had their temples swirling with incense. Chefs discovered pepper, forever changing Chinese cuisine. Herbalists began to swear by the medicinal powers of powdered rhino horn, driving the Asian rhinoceros to the brink of extinction.

Custom dictated that tribute be reciprocated with gifts. Initially, traders departed with ships laden with iron, silk and manufactured goods. But as China's demand for luxuries increased, foreign merchants began requesting cash, prompting an official named Chang Fang-p'ing to lament that "currency was being drained off like the waters of the sea." By 1150, the world's richest nation was cash-poor.

England would encounter a similar situation seven centuries later, when consumer demand for Chinese tea and silk created a balance of payments crisis for the Exchequer. Britain's East India Company solved the problem by introducing Chinese black-market middlemen to opium, which they gladly took in lieu of cash. But the emperors of the Song dynasty (A.D. 960-1279) devised a more humane solution: mass-producing and exporting ceramics.

By the 12th century, China's appetite for imported goods was leading to a shortage of cash, so Song dynasty emperors ordered the mass production of ceramics for use as currency. Traders liked the cargo because it provided ballast as well as profit.

For more than 1,000 years before the birth of Christ, China had been making the world's best ceramics (which is how the term "china" came to mean fine plates, cups and bowls made of glazed clay). China's preeminence was based on an abundance of high-quality clay, vast veins of coal and an ability to design high-temperature kilns; Europe's technology lagged so far behind that Marco Polo's report of "black stones which burn like logs" was widely disbelieved. Foreign traders welcomed pottery as a cargo, not only because it was profitable, but also because it provided ballast. By the middle of the 15th century A.D., ceramics comprised a major part of Asia's maritime trade.

Today, marine archaeologists, art historians and others are embracing pottery salvaged from ships that sank centuries ago. "Each new shipwreck revolutionizes previous thought," says John Miksic, associate professor of Southeast Asian studies at the National University of Singapore. "For generations, students were told their history began with the arrival of the British. Now that their lost history is being slowly recovered, they know their pre-colonial past consists of more than isolated fishing villages."

THE CARIBBEAN AND MEDITERRANEAN SEAS have attracted treasure hunters for centuries, but archaeological exploration of Southeast Asia's ancient shipping lanes began only after the Vietnam War. Since then, at least 130 shipwrecks have been identified. One of the first great finds, excavated in 1986, was the *Geldermalsen*, a Dutch East India Company ship that foundered southeast of Singapore in 1751. Recovered from the wreck were 100,000 pieces of Chinese porcelain and 125 shoe-shaped gold bars.

In 1991, some 60,000 pieces of early Qing dynasty (1644-1912) porcelain were salvaged from the South China Sea near the Vietnamese port of Vung Tau. Two years later, the 1817 wreck of the Bombay-based *Diana* was found in Malaysian waters outside Malacca's harbor, along with its cargo of cobalt-blue-and-white dinnerware.

And the junk *Tek Sing*, which sank in 1822 with more than 350,000 ceramic pieces, was located in Indonesia's Gelasa Strait in 1999. Two years later, fishermen found the remains of a junk from the Ming dynasty (1368-1644) some 40 nautical miles east of the Vietnamese city of Phan Thiet. The wreck was loaded with cast-iron cooking vessels and also contained enamelware and hundreds of stoneware jarlets with lids elaborately molded in the shapes of chrysanthemums, crabs and turtles.

Many of the items recovered from these wrecks were in pristine condition; when auctioned, they sold for a total of nearly $40 million, some to private collectors but others to museums. Some goods—typically those plundered from shipwrecks closer to shore or looted from graves—find their way to Asian antiques stores as well as to collectors.

"Here's my Ming collection," said Ivan Polunin, an 86-year-old retired medical professor who sells and trades out of a dehumidified bunker in Singapore that one reporter dubbed the "Den of Antiquity." He led me through rooms stacked with incense burners from the Qing dynasty, jarlets from the Yuan dynasty (1279-1368) and a serving bowl from the Han dynasty (202 B.C.-A.D. 220). "I have a rogues' gallery too," he said, "but it's mostly inferior stuff from the warlord and Communist periods."

Polunin bought his first ceramic in 1973, in the Indonesian city of Ujung Pandang (now Makassar), but he didn't

KRIS LEBOUTILLIER / GETTY IMAGES

start collecting "with a vengeance" until 1983. "I began going out with Filipino grave robbers," he said. "I was such a good customer that they would prepare for me in advance by digging down the first four feet."

But Sten Sjostrand, a Swedish former naval architect and the current owner and managing director of Nanhai Marine Archaeology in Malaysia, would likely take a dim view of Polunin and his early acquisition techniques. A sign hanging in his warehouse reads, "We are not antique dealers. We are marine archaeologists." In cooperation with Malaysia's Department of Museums, Sjostrand has excavated nine shipwrecks over the past 14 years. Typically, he underwrites the salvage costs and gives Malaysia its pick of 30 percent of his finds. He keeps the rest, which he sells to recover his expenses, fund his next expedition and, he hopes, make a bit of profit.

"It's impossible to describe how I felt when I found my first shipwreck," Sjostrand said. "I was down 46 meters on the bottom of the South China Sea staring at thousands of pieces that had been made two centuries before Christopher Columbus sailed to the New World. The sight was so mesmerizing that I overstayed my time and didn't bring up a single piece."

Some preservationists, however, believe that shipwrecks *should* be left at the bottom of the sea. "*In situ* preservation shall be considered as the first option," reads the first rule of the 2001 Convention on the Protection of Underwater Heritage adopted by some countries within the United Nations Educational, Scientific and Cultural Organization (Unesco). The convention calls for "recovery of the underwater cultural heritage [that] achieves its maximum protection" and rejects buying, selling or trading recovered objects and their "irretrievable" dispersal. "States can bring objects to the surface as long as they are preserved and made available to the public," said Guido Carducci, chief of the International Standards Section of Unesco's Division of Cultural Heritage.

To which Sjostrand says, "Unesco's policy is conceived by desk-bound archaeologists without money who have no concept of reality." One of his concerns is looting, particularly if a shipwreck site is somehow marked.

In 2003, he said, some fishermen directed him to a Song dynasty wreck 400 yards off the northwestern tip of Borneo; he and his crew left a temporary marker buoy at the site and sought permission to excavate it from the museum of the Malaysian state of Sabah. "When we returned two days later, two fishing boats had their crews diving," Sjostrand said. "I found out later that the fishermen recovered a number of 1,000-year-old bronze gongs they sold as scrap for 30 cents a pound."

Secrets of the deep are also threatened by industrial-scale fishing. In 1996, Sjostrand said, he found a circa 1400 wreck that contained a type of green pottery known as celadon from China, as well as a pale bluish green Thai celadon that no present-day expert had seen before. The massive mound suggested a cargo of at least 100,000 pieces, but because it lay dangerously deep at 189 feet, Sjostrand left it intact. When he returned in 2001, he said, Thai fishing trawlers had flattened the mound and left the seabed strewn with potsherds.

Some authorities believe that shipwrecks would be best protected if they were left where they lie, but marine archaeologist Sten Sjostrand, right, with a Malaysian seaman, says wrecks are continuously threatened by looters and large fishing operations.

IN 1999, Michael Flecker helped excavate the oldest and most valuable shipwreck yet found in Asian waters. A year earlier, an Indonesian sea cucumber fisherman approached marine archaeologist Tilman Walterfang with pottery the fisherman said he had found several miles off the Indonesian island of Belitung, in the treacherous Gelasa Strait. The russet-colored vessels' iron oxide glaze identified the pottery as products of Hunan's Changsha kilns—renowned for the quality of the ceramics they produced—and the Buddhist, Taoist and Islamic motifs suggested that they had been crafted for a variety of locales.

Walterfang, the managing director of the Singapore-based firm Seabed Explorations, knew that the area was a graveyard for ancient trading vessels. He headed for the strait within days. When he made his first dive down to the seabed, he saw three ewers, or wide-mouthed jugs, protruding from a coral-covered mound about ten yards long—evidence of a substantial cargo. "The water was murky," Walterfang told me, "but I could tell the cargo was more than a thousand years old. I felt at that moment like a person who had discovered a pyramid or an emperor's grave."

The same silt from a nearby river that had made the water murky was also creating an anaerobic environ-

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ment that helped protect metal and wooden artifacts (including the ship's hull). With monsoon season approaching, Walterfang brought up what he could, then, after a few months, returned with Flecker, who supervised the diving operations.

"As I dove down through the water it seemed as if I were swimming back through time," Flecker later recalled. Within minutes of reaching the wreck, however, Flecker realized something was amiss. A large earthenware jar in which bowls had been packed was now smashed. "While the crew was ashore, local fishermen had looted part of the cargo," Flecker said. "They tried to hoist the heavy jar out of the ship. When that failed, they smashed it and grabbed the ceramics inside."

The ship's timbers were in remarkable condition. "The hull planks were stitched together with no sign of the wooden dowels of Southeast Asian ships or iron fastenings characterizing early Chinese ships," Flecker recalled. "The wood itself was not Chinese, but timber that grows in India and formerly was used by Arab and Indian shipbuilders." Walterfang and Flecker sent a piece of wood, along with some star anise and aromatic resin found in the cargo, to New Zealand for radiocarbon analysis. Scientists there dated the samples to the early ninth century—from the Tang dynasty (A.D. 618-906). In addition, two Changsha bowls were inscribed with the year 826. Though the ship has been determined to be of Arab or Indian origin, it is called the "Tang wreck" for its cargo.

"I felt at that moment like a person who had discovered a pyramid or an emperor's grave," says Tilman Walterfang of his initial dive to the Tang wreck. The site yielded both ceramics (such as this 9th-century ewer) and clues to shipping history.

Until the wreck's discovery, historians' view of Arab ships was colored by Marco Polo's 13th-century observation that "the vessels built at Ormuz [sic] are of the worst kind, and dangerous for navigation." The planks, Polo observed, are stitched "with a kind of rope yarn stripped from the husk of the Indian nuts," or coconuts. But Flecker's examination of the hull concluded that the stitching together of planks made watertight with wadding gave Arab ships the requisite flexibility to weather tempestuous ocean voyages.

News of the wreck's date and origin took historians by surprise. "We have always inferred that Middle Eastern and Indian ships carried the bulk of long-distance maritime commerce because of the rapid spread of Islam to maritime Asia and the absence of any mention of Chinese shipping in Chinese chronicles prior to the 12th century," said Geoff Wade, a senior fellow at Singapore's Asian Research Institute. "But now, because of the Tang wreck, we have material support for our assumption."

But the wreck's true value wasn't fully appreciated until the excavation was done and Seabed Explorations had recovered more than 60,000 objects. Among them were the earliest blue-and-white stoneware ever found; bronze mirrors, including one dating from 758; green-glazed stoneware with incised floral designs; the largest known Tang gilded silver flask; plus ornate gold bowls, some dishes and a cup that seem to have been crafted for a sultan or caliph.

"The most significant aspect of the Tang treasure is that the glaze is perfect after 1,200 years in the sea and that many of the designs are Islamic, not Chinese," said Alvin Chia, a project director for Sentosa Leisure Management Private Ltd., which with the Singapore government purchased the Tang hoard from Seabed Explorations for $32 million in 2005. "This find makes a unique contribution to our understanding of Tang material culture and its place in international trade."

The Tang artifacts have been featured at a Singaporean diplomatic conference, a library opening and a museum exhibition; Singapore is planning a maritime museum for these and treasures from other wrecks. And shipwreck ceramics are finding favor elsewhere. In Thailand, a Southeast Asian Ceramics Museum opened in 2002 at Bangkok University. In Malaysia, a gallery at the National Museum in Kuala Lumpur showcases shipwreck porcelain in re-created hulls. "A country with no history is like a tree without fruit," says Adi bin Taha, director general of the Department of Museums. "Malaysia safeguards its heritage by searching for these wrecks because our history is hidden in the sea."

Somewhere in the waters off Sumatra, the *Flor do Mar* still rests—and with it, perhaps, the Malacca sultanate's looted treasure. Rais Yatim, Malaysia's minister of culture, arts and heritage, says he would like to lead an expedition to find the wreck. "Malays are indifferent to the colonial history of Portugal and Holland," he told me. "The history we care about—our history—went down with that ship."

TANYA LAKE

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The Family Tree, Pruned

Its lure is powerful—but genealogy is meaningless, relatively

BY RICHARD CONNIFF

MY 18-YEAR-OLD DAUGHTER gets annoyed when I express my suspicion that genealogy is bunk. Sometimes this happens when she's telling me about a friend who claims to be directly descended from Charlemagne. Other times it's when we're working on our wall of photographs of my wife's forebears. My daughter says I'm just jealous because my side of the family is short on photos, and the few we have suggest a lineage thick with sheep thieves and potato pickers. I say my skepticism has more to do with arithmetic.

Go back just ten generations, to about 1700, and in theory I have more than 1,000 direct ancestors. Back 20 generations, the number climbs to well over a million. If I look to my presumed descendants in future generations, the numbers are equally daunting. Either way, how much should I care?

So you can claim Charlemagne (left) as an ancestor? Big deal, says the author (above, with his wife's forebears): so can about half of the people living today.

KATJA HEINEMANN / AURORA SELECT; SCALA / ART RESOURCE

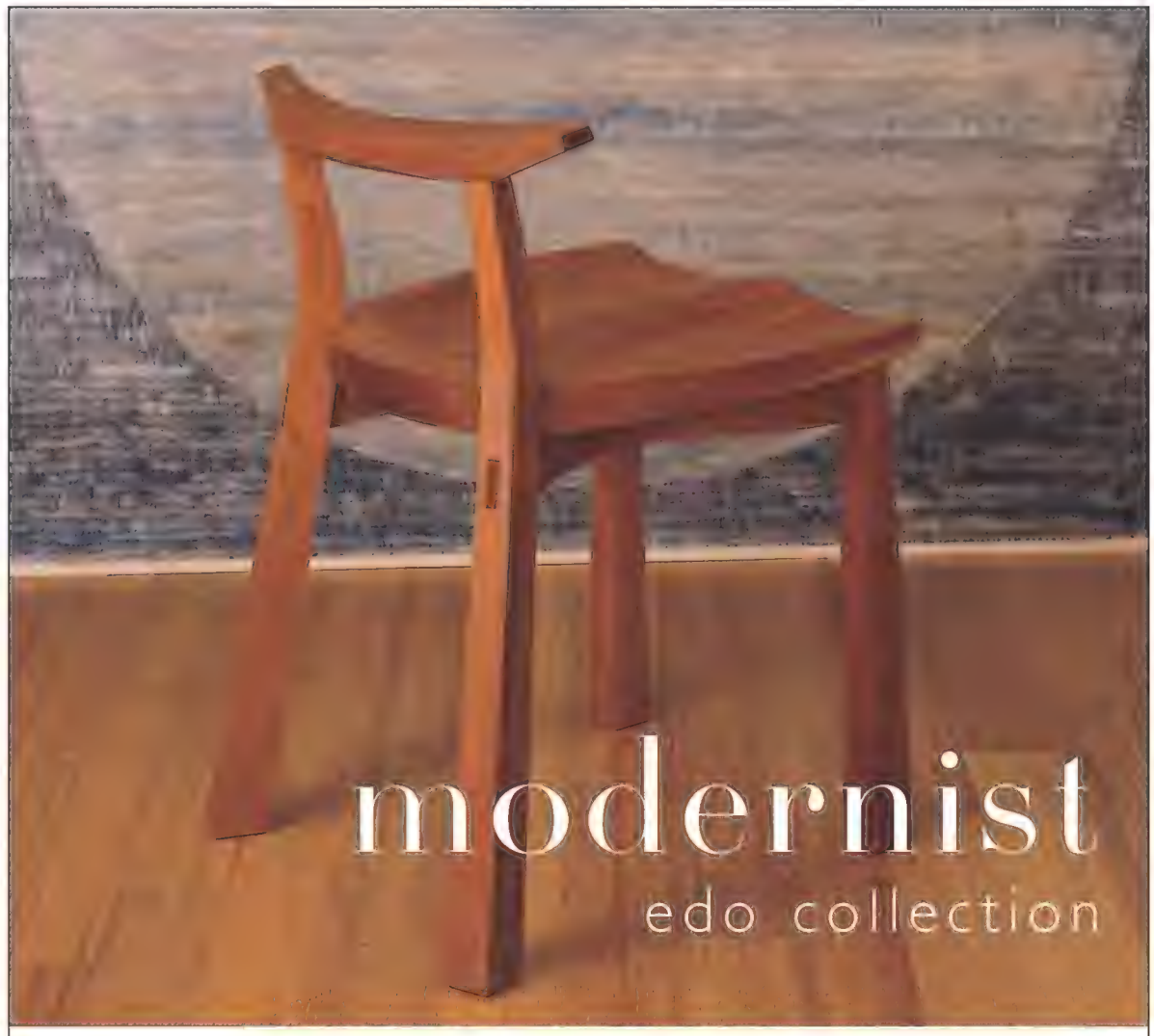
Growing up in a family of six kids, I had enough trouble just keeping track of my siblings. The idea of 1,000 ancestors leaves me paralytic.

Until recently, hardly anybody kept close track of their ancestry. They were too busy picking lice out of their hair or fending off the Black Death. Detailed record keeping didn't exist, nor did the family names we now take for granted as the key to genealogy. (Surnames weren't widely used until around the 15th century in Europe, and not until the 20th cen-

tury in some parts of the world.) Instead of obsessively trying to link themselves to social betters in the distant past, people were basically stuck with the five generations immediately around them—grandparents, parents, siblings, children and grandchildren. And unlike the lofty souls we strode among in days of yore, the people we live with in the here and now have a dismaying knack for reminding us of our humble origins. To a former boarder with social pretensions, my great-grandmother once remarked, "I wouldn't take ye back if yer arse were made of diamonds." No descendants of Charlemagne need apply.

It's different now. People have become consumed with genealogy; it's a $1 billion industry in this country, says Elizabeth Shown Mills, former president of the American Society of Genealogists. That adds up to a lot of Americans constructing family trees. And when they hit pay dirt, the results often become a claim on the public attention: singer/songwriter Moby takes his stage name from the great white whale in his distant relative Herman Melville's best-known novel. *Playboy* founder Hugh Hefner boasts that he is an 11th-generation descendant of a *Mayflower* Pilgrim. Author Joan Didion's great-great-great-grandmother rode with the Donner party. And Paris Hilton gets her first name from an ancestor who was the preening twit in *The Iliad*. (OK, just kidding about that one.)

Genealogy became a subject of popular fascination after *Roots*, the 1970s book and television miniseries in which writer Alex Haley traced his ancestry back to an 18th-century warrior in the African nation of Gambia. Like many genealogies, this one turned out to be fictionalized (and partly plagiarized). Regardless, Americans proved highly susceptible to genealogy's lure. Maybe it's because we live in such a mobile society, often separated from family by thousands of miles. Many African-Americans, in particular, feel cut off from their heritage by the slave trade. Conjuring up a family tree and figuring out where we sit in it gives us back a sense of place, of connectedness. Throw



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What exactly does ancestry mean? *Playboy*'s Hugh Hefner (opposite, with Playmate Sara Jean Underwood) boasts descent from a *Mayflower* Pilgrim (above).

computers, Internet databases and DNA into the mix, and this compelling hobby can become an obsession.

My daughter dotes on a Web site called geni.com, which enables her to put genealogical information online and connect with information about distant, unsuspected relations. Or even not so distant. I discovered three first cousins I'd never met, though we all grew up in New Jersey. My elder son enjoyed dinner with a first cousin once removed living near him in Seattle. (He knows precisely how they are related because geni.com told him—probably an improvement on my catchall term "dog kin.")

All this sounds harmless enough. But people intent on using DNA to make such connections now venture out to "swab the cheeks of strangers and pluck hairs from corpses," according to a recent article in the *New York Times*. One 63-year-old "wastewater coordinator" and amateur genealogy sleuth staked out a McDonald's so she could covertly lift DNA from the coffee cup of "the last male descendant of her great-great-great-grandfather's brother," who quite reasonably regarded his DNA as none of her business.

Doesn't it make you wonder if we shouldn't think through this genealogy thing a bit more clearly? There are

BETTMANN / CORBIS

FRANK TRAPPER / CORBIS

more potholes and mudslides on this road than most of us care to admit.

Let's start with the genealogical follies of the rich and famous. They used to be the only ones who bothered with family history. It was a way to maintain their power, by asserting that they'd always been here and therefore always would be. Curiously, biologists doing long-term studies of primates in the wild say that's how family connections function in nature too: in high-ranking baboon and vervet monkey families, grandmothers routinely make sure that little Tiffany Baboon and young Percy Vervet III get special treatment from lesser juveniles. This gives the kids a habit of social dominance—and can thus help maintain a monkey dynasty for generations.

A lengthy pedigree is so useful that human families have often found it convenient to invent one. When a British family ascended in the 17th century from being mere Feildings to being Earls of Denbigh, for instance, they proclaimed the happy news that they were in fact kin to the Hapsburg emperors. In India, royal families employed genealogists to recite the family history, in one case going back 450 generations. That would be around the end of the last ice age and well before the birth of civilization itself. It still works today: the banking firm of Wells Fargo has a family historian on staff to help woo wealthy clients with tales of their ancestors.

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A trip to Broome. We took the long trip to Australia to study the famous white lipped oysters that produced magnificent pearls that are often 11-14mm—about 8 times the size (and 8 times the price!) of a standard pearl. Not only did these oysters produce the rare South Sea pearl, but they also produced a tremendous amounts of mother of pearl or nacre. Nacre is the lustrous iridescent substance which is secreted by the oyster to form the shiny inside of their shells. When nacre secretions are deposited around the pearl seed they build up to form a full sized pearl. Our bio-scientists went to work to see if we could improve upon Mother Nature's process a little. By extracting the seed pearl from young oyster shells and speeding up the process in the lab, we coated these natural seed pearls with nacre from the inside of the giant shells, and were able to produce the breathtaking lab-coated Australian Pacific Pearl.

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But family history often goes awry because of our wayward human nature. Social scientists conservatively estimate that "misassigned" paternity occurs in about 10 percent of all human births. That means Daddy isn't always the guy listed in the official records. We're not just talking the Anna Nicole Smith case here, or segregationist senator Strom Thurmond, who secretly fathered a child by his family's black housekeeper. Go back ten generations in virtually any family, and the odds are that someone has climbed unacknowledged up the family tree. Sir Winston Churchill prided himself on his descent from the great 18th-century general John Churchill, Duke of Marlborough. But the family had a colorful history of sexual misadventure; Winston's own father died of syphilis, according to biographer Marian Fowler, and his mother was said to have taken 200 lovers during the course of their marriage. Likewise, Hugh Hefner would doubtless admit that even New England Pilgrims sometimes fooled around. So genealogical skepticism is prudent. The corollary is that many humble souls born in the immediate vicinity of great families can probably make just as good a claim for a place in the family hierarchy. In fact, a group called the Descendants of the Illegitimate Sons and Daughters of the Kings of Britain does just that. You can look them up at royalbastards.org.

But let's say your ancestors were saints and your pedigree happens to be immaculate. How closely can you connect yourself to that scientific genius, that noted author, that fighter for his people's freedom? The simple mathematics of division by two in each generation would suggest that, after nine generations, Winston Churchill would possess no more than 1/528 of his famous ancestor's DNA—and DNA inheritance isn't so simple. At conception, half the mother's DNA and half the father's go into each of the child's 23 chromosome pairs. But there's no telling how much of it will make the more or less random cut when their grandchildren are conceived, or in any of the subdivisions after that. In theory,

News reports that one of Senator Barack Obama's ancestors came from Ireland put him in the company of about 30 million of his fellow Americans.

you may possess no genetic connection whatsoever to your own great-great-great-grandfather.

So what's a better way to think about genealogy? The temptation is to pay attention only to the good news, and look on the family lineage as a golden thread leading from some glorious ancestor straight down to the lucky modern-day descendants. But no family lineage is a single thread. It's more like a broad fan of a thousand, or a million, threads coming together from all over the world to weave the fragile patch of material representing the generations of family immediately around us.

And here's the curious thing about this ancestral fan: it doesn't follow the simple mathematical rule of doubling with each generation back in time. If it did, we would have between 4 billion and 17 billion ancestors at the time of Charlemagne, in A.D. 800, when there were only a few hundred million people alive on earth. Instead, because of intermarriage, the same ancestors start turning up in any lineage over and over. Thus Edward III, king of England from 1327 to 1377, appears more than 2,000 times in the family tree of the modern-day Prince Charles, and he would probably occupy an additional 12,000 spots if the

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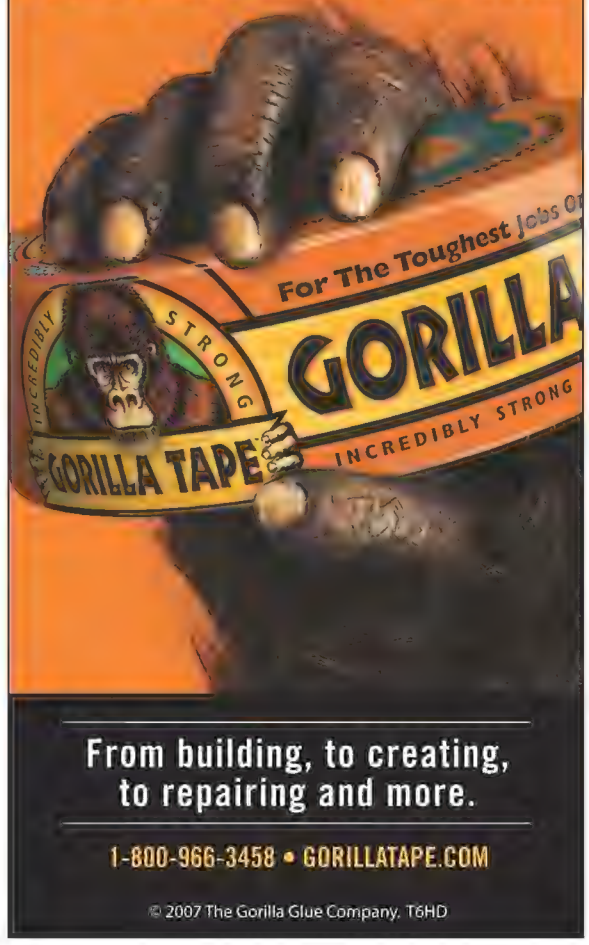

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full genealogy were known, according to Robert C. Gunderson, a professional genealogist who has studied the British royal family. Royal families are a special case, of course, because they used inbreeding to keep the wealth and power within a limited family group. But virtually all families practiced some degree of inbreeding, often without realizing it. It was a natural byproduct of marrying people who lived within walking distance.

So common ancestors start to turn up even in families who might appear to be completely separate. In the 2004 U.S. presidential election, for instance, genealogists traced both George W. Bush and John Kerry back to the same couple living in the Plymouth Colony in the 17th century. This time around, someone will surely demonstrate not merely that Senator Barack Obama has an Irish ancestor (as an Irish vicar recently did), but that he is a descendant of Finn MacCool and a ninth cousin of President John F. Kennedy. Almost everyone reading this article has Julius Caesar as a common ancestor. Half of you can probably claim Charlemagne, as well. That's because both lived a long time ago and went about the business of forefathering *con gusto*. You are probably also descended from every sniveling peasant who ever managed to replicate in ancient times.

The idea of our common ancestry is hardly new. That's what the story of Adam and Eve was all about. Even so, a lot of people were surprised in the early 1990s after genetic analysis determined that we are all descended from a "mitochondrial Eve" who lived in Africa just 100,000 to 200,000 years ago. But that study looked only at the mitochondrial DNA, which is passed from mother to daughter. That got other scientists wondering what they'd find if they looked at genealogy rather than genetics. And when they calculated the overlapping ancestry in both the paternal and maternal lines, they concluded that everyone on earth today shares a common ancestor who lived just 2,000 to 3,500 years ago. Because that ancestor's parents and grandparents were natural-

ly also common ancestors, our genealogy starts to look increasingly similar with each generation back in time. It's not just that we have a common ancestor; by the time you go back 5,000 to 7,000 years, all our ancestors are the same. At that point, says Yale statistics professor Joseph T. Chang, "everybody is either a common ancestor of all people alive today, or of nobody alive today." Or as he and his co-authors put it in an article in *Nature*, "No matter what languages we speak or the colour of our skin, we share ancestors who planted rice on the banks of the Yangtze, who first domesticated horses on the steppes of the Ukraine, who hunted giant sloths in the forests of North and South America, and who labored to build the Great Pyramid of Khufu." Our genealogy is, in a word, identical.

So am I going to tell my daughter to lay off geni.com and forget about the family photos? Probably not; she is a teenager and has a terrible scowl. In any case, there isn't much satisfaction in the idea that we are all basically the same, all just part of the grand, bland Family of Man. What makes families interesting isn't the 99.9 percent of things we have in common, but that quirky extra bit that makes us different. I'd like to know a little more, for instance, about the origins of our family name, which means "son of a black hound" in the Irish language. And I am deeply curious about my Italian great-grandfather, who used to chase my father down Webster Avenue in the Bronx swinging a sickle and yelling, "I catch-a you, I keel-a you." These are the small, sweet pleasures of family history.

But I also want my daughter to understand that nothing in her genealogy defines her. Our ancestors are dead, and they should let us rest in peace. What makes us who we are, what makes us people worth knowing, comes from within ourselves, and from the often annoying, somewhat laughable, occasionally lovable families we live with now.

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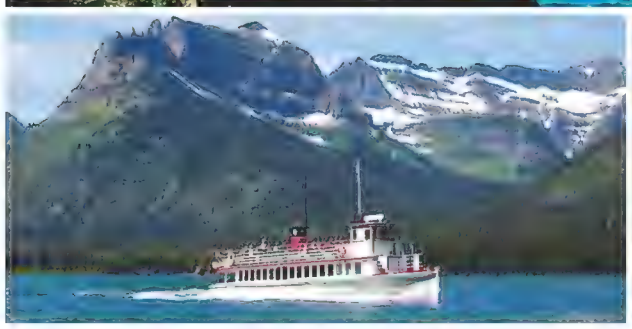

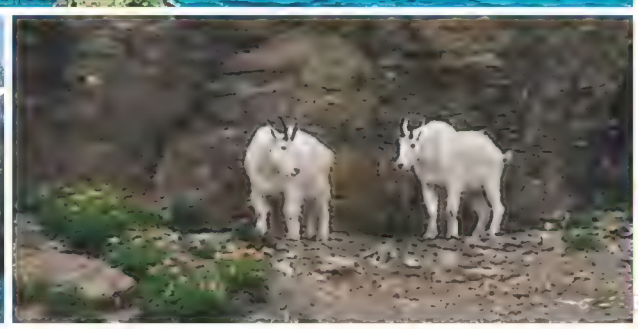

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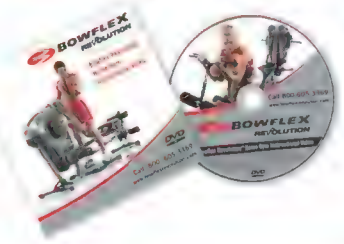

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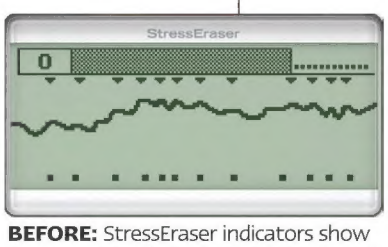

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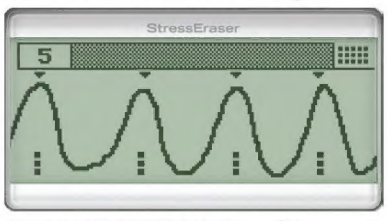

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The Puck Stops Here

Mom goes to hockey camp

BY ANN HODGMAN

AT 8:30 IN THE MORNING it was 300 degrees out, but there was a pile of snow lying next to the rink entrance. Summer hockey camps always manage to find ice somewhere. Since this camp was for goaltenders ages 6 to 11, most of them were too small to carry their equipment. While their moms lugged their bags, the campers carried their sticks and trudged along in nervous silence.

"Son's name?" a coach asked as I staggered up to the registration table with a goalie bag on my shoulder.

"No, see, *I'm* the goalie," I said—an overweight, 40-something goalie who had never played any sport until the year before, when she had been hit by what can only be called a lightning-bolt conversion while watching some kids on the ice, and had taken up hockey. I became a goalie only because my local team (all novice moms) needed one; I enrolled in goaltending camp at our coach's desperate suggestion. Why bother finding an adult camp, I thought. This one was close to my house. Besides, when it came to hockey, I was "as a child"; until recently I had thought a Zamboni (the ice-smoothing machine, for anyone like me out there) was called a Zambezi. At a kids' camp, I reasoned, there was at least a chance I wouldn't be the only beginner.

But I *was* the only beginner and, during the warm-up skate, the only skater who had to pitch herself off the ice and lie on the floor while a 20-year-old coach trained a fan on her. "I always feel like throwing up when I work out too hard," I told him in a faltering voice. "It'll go away in a second." He looked at me with kindly incomprehension; I had been skating for less than two minutes. Back on the ice the kids were zizzing by, and then an unpleasant grating sound arose. Oh, God, they were setting up the nets! The drills were starting! I was keeping a *whole coach* away from his job! I groaned myself back to my feet, wishing I could die, and waddled off to start boot camp.

As the days passed, I learned that while there are many ways to stop a puck, generally speaking you can divide them into Getting Hit with the Puck and Falling on the Puck. Another important lesson: even if you have a grown-up job (world-famous writer, in my case), there are many, many things that 6-year-old boys can do better than you. Also: you never outgrow the shame of being picked last. Our off-ice practice included soccer, and no one wanted a mom on his team.

Why didn't I say, "Hey, I'm a grown-up—I'm going to skip the soccer and take a nap"? Because I was in thrall to the idea that at the end of camp, I'd skate away with all the trophies. Didn't my heart's being in the right place count more than anything? Wouldn't pluck take me farther than skill? Wasn't I starring in that movie in which the one who suffers most triumphs in the end?

Actually, no. I entered camp knowing nothing about goaltending, and I left camp knowing . . . slightly more. I didn't win a single daily shootout, no matter how carefully the shooters aimed at my stomach. (I always shied out of the way.) Even my mom-ishness was useless. Once, I tried to intervene in a jeering contest two boys were having about the camp crybaby. "How is his *skating*?" I asked in a teacherly voice. The boys paused. "*You're* better than he is," one of them finally said with scorn.

All my mom-ishness instantly melted in the glow of pride I felt at being not quite the lowest-ranking member of the tribe.

I'M 50-SOMETHING NOW and still goaltending. For all I know, the movie may yet end with my getting a trophy. My cheering teammates may yet hoist me to their shoulders as tears rain down my wrinkled cheeks. "She won the championship game in a 20-man shootout!" the announcer may shout.

Or not. The last time I faced a shootout, I didn't make the save because the woman shooting was a friend of mine.

RICHARD THOMPSON